ADDITIONAL SUPPORTING DOCUMENTATION

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AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

American Electric Power
1 Riverside Plaza
Columbus, OH 43215
aep.com

March 5, 2018

Alice H. Chow
United States Environmental Protection Agency
Region 3
1650 Arch Street
Mail Code: 3AP40
Philadelphia, PA 19103-2029

Re: West Virginia State Implementation Plan Modeling

Dear Ms. Chow:

Thank you and other members of the agency staff who participated in the call with Appalachian Power Company (dba American Electric Power, hereafter referred to as "AEP") and the West Virginia Division of Air Quality ("WV DAQ") to discuss the modeling demonstration submitted to support the SO_2 attainment demonstration in Marshall County. We appreciate the opportunity to provide additional support for the stack height used for the Mitchell Units in that demonstration. Based on all of the material attached herein and in the submissions made by WV DAQ, there is ample evidence that the use of a 1,000' stack height in the modeling demonstration is a conservative assumption, consistent with applicable regulations in 40 CFR §51.118, and the historic implementation of these provisions in Marshall County.

Federal regulatory requirements with respect to stack height are set forth at 40 CFR §51.118(a), which places certain limits on the stack height credit that can be used to determine emission limitations required of a source. However, 40 CFR §51.118(b)(1) provides that such limitations do not apply to "stack heights in existence . . . on or before December 31, 1970" unless *the source itself* is constructed, reconstructed, or major modifications are carried out after December 31, 1970, citing the Prevention of Significant Deterioration ("PSD") and Non-Attainment New Source Review ("NNSR") provisions of the Act. Notably, nothing in this section references a source owner's voluntary construction of a shorter stack, or any trigger related to the submission of a SIP revision for a source with a grandfathered stack height. Since the Mitchell Plant has not been constructed or reconstructed since December 31, 1970, and since the Mitchell Plant has not been subject to a major modification since that time, the development of its emission limitations may rely on the "stack height in existence . . . on or before December 31, 1970."

The original stack at the Mitchell Plant is 1,204 feet in height. The grandfathering of the existing stack height was confirmed based on a submittal by the West Virginia Air Pollution Control Commission on April 30, 1986. EPA issued a proposed rule, concurring with the conclusion by the

State that the Mitchell Plant stack height of 1,204 feet was grandfathered and that its emissions limits did not require revision as a result of the federal stack height regulations promulgated on July 8, 1985.[1] That proposal was finalized by EPA by Federal Register publication in May of 1990.[2]

The grandfathered 1,204-foot stack height for the Mitchell Plant has been relied upon by both the State and EPA for SIP development for many years. This is illustrated by the modeling data supplied to the State of West Virginia by AEP on December 27, 1988, in support of a formal compliance demonstration for another plant which specifically shows Mitchell being modeled at 367.1 meters (1,204 feet). See attached Exhibit C, Enclosures 1 and 2. That same data was part of the package of information relied upon by EPA in its correspondence to the State of West Virginia dated April 29, 1990, which provided its "Strategic Plan for Sulfur Dioxide" addressing the Mitchell Plant and other sources in the same area. See attached Exhibit D, Attachment 3-3.

This interpretation is also supported by the treatment of the Kammer stack height discussed in Exhibits C and D, where the pre-1970 stack height of 600 feet was used in modeling demonstrations even after the plant was equipped with a new 900-foot stack in connection with the installation of controls. EPA stated in correspondence dated August 5, 1988 (see attached Exhibit E) that:

> [The plant owner] can elect to evaluate an emission limit for Kammer at the grandfathered stack height of 600-feet. If Ohio Power should choose this option, it is likely that only a relatively small emissions reduction at Kammer would be required.

WV DAQ provided extensive information about the GEP stack height issues in Appendix C to the SO_2 modeling demonstration. In WV DAQ's responses to U. S. EPA's comments on that modeling, they noted that the modeling protocol was developed with input from Region 3 personnel, and that the 1,204-foot stack height was fully creditable. Attached as Exhibit F is correspondence from Marcia Spink to Tim J. Carroll of WV DAQ dated May 5, 1998, approving that protocol as consistent with Appendix W.

The same stack height was used in the modeling developed in support of West Virginia's Regional Haze Implementation Plan.[3] Attached as Exhibit G are excerpts from the docket for that rulemaking, which document the submission of information necessary to model the Mitchell Plant based on the new stack, portions of Appendix H to the modeling used to identify BART-eligible sources, and Region 3's technical support document for that modeling demonstration.

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1 *Approval and Promulgation of Implementation Plans; State of West Virginia; Stack Height Review,* Proposed Rule, 55 Fed. Reg. 2245, Jan. 23, 1990, attached as Exhibit A.

2 *Approval and Promulgation of Implementation Plans; State of West Virginia; Stack Height Review,* Final Rule, 55 Fed. Reg. 21751, May 29, 1990, attached as Exhibit B.

3 *Approval and Promulgation of Air Quality Implementation Plans; West Virginia; Regional Haze State Implementation Plan,* Final Rule 57 Fed. Reg. 16937 (Mar. 23, 2012).

Most recently, EPA modeling in support of the Stephen D. Page Memorandum dated October 27, 2017, related to "Supplemental Information on the Interstate Transport State Implementation Plan Submissions for the 2008 Ozone National Ambient Air Quality Standards under the Clean Air Act Section 110(a)(2)(D)(i)(I)"[4] was based on modeling data which assumed a 1,000-foot stack height for the Mitchell Plant. See attached Exhibit H for data related to the 2011 Base Case modeling run[5] and data related to the 2023 future year modeling run.[6]

This information provides ample support for the stack height used in the modeling demonstration. If you have questions concerning the data provided, or wish to discuss further, please contact Scott A. Weaver at (614) 716-3771.

Best regards,

John M. McManus
Vice President, Environmental Services

cc: Fred Durham, Director, WV DAQ (w/enc.)

4 https://www.epa.gov/sites/production/files/2017-10/documents/final_2008_o3_naaqs_transport_memo_10-27-17b.pdf

5 https://protect-us.mimecast.com/s/bBOxC9r2WEhkJw36uE9dSw?domain=newftp.epa.gov

6 https://protect-us.mimecast.com/s/ya-3C0R9KrIGnAo9c2FUEt?domain=newftp.epa.gov

EXHIBIT A

In addition, the proposal would provide a less effective deterrent against violations than the current civil penalty system in the following respects: (1) Allowing credits against future civil penalties would minimize the incentive for maintaining compliance that such penalties are intended to provide. (2) Since an operator could receive credit for reclaiming sites on which he or she forfeited bond, the deterrent effect of bond forfeiture would be reduced. (3) The proposal does not specify the dates by which the agreement must be entered and reclamation initiated and completed. It is thus less effective than 30 CFR 845.20 which specifies that the penalty shall become due and payable upon expiration of the time allowed to request a hearing. (4) As currently proposed, Virginia would impose no additional penalty on operators who default on their reclamation agreements. (5) Neither the proposed rules nor the standard contract form contain a provision stating that all penalties become immediately due and payable upon contract default.

The proposal is less effective than the Virginia program and corresponding Federal rules, and is less stringent than SMCRA.

17. VR 480-03-19.835 and 480-03-19.836 Remnant Remining

(a) *Definition of remnant.* In VR 480-03-19.835.5, Virginia defines a "remnant" as an area which is physically or economically isolated by past surface coal mining practices and which is uneconomical to mine and/or reclaim under normal regulatory program requirements. One commenter stated that the rule must include criteria concerning the size of the area and specific standards used to determine economic feasibility. OSM agrees with this comment and finds that the definition is less effective than the federal regulations.

(b) *Operations and performance standards.* VR 480-03-19.835.12 would establish application requirements for operations proposing to mine remnant areas, while VR 480-03-19.836 specifies the performance standards which would be applicable to such operations. OSM agrees with the commenter who stated that the performance standards of Part 836 are deficient in their requirements. Both section 835.12 and Part 836 resemble the State's coal exploration requirements. However, since these operations would be surface coal mines, not coal exploration operations, the Director finds the proposed State rules to be less stringent than SMCRA and less effective than the Federal regulations, which establish far more comprehensive requirements for mining operations. Also, neither SMCRA nor the Federal regulations authorize the relaxation of permitting requirements on environmental protection standards on the basis of economic factors.

OSM agrees with the commenter who pointed out the three sections, VR 480-03-19.835.12(a)(12), 480-03-19.836(e)(2) and 480-03-19.836(e)(5) each provide different pollution discharge requirements that could cause confusion.

IV. Summary and Disposition of Comments

Public Comments

The Director solicited public comments and provided for a public hearing on the proposed amendments in the February 19, 1988, Federal Register (53 FR 5002-5004). Comments were received from the National Coal Association (NCA). Following Virginia's resubmittal of additional information on two separate occasions, the Director reopened the public comment period in the August 12, 1988, Federal Register (53 FR 30450-30452) and in the March 22, 1989, Federal Register (54 FR 11746-11750). Comments were received from the National Wildlife Federation (NWF). Since no one requested an opportunity to testify at the scheduled public hearings, the hearings were cancelled.

The NCA generally supported the Virginia proposal in its entirety.

The NWF provided several specific comments to various sections of the Virginia amendment. OSM responded to these comments in findings: 1.(b); 3.; 4.; 5.; 7.; 8.; 9.; 10.(a), (b), (c); 11.(a), (b); 12.; 13.(a); 16.; and 17.(a), (b).

Agency Comments

Pursuant to section 503(b) of SMCRA and the implementing regulations of 30 CFR 732.17(h)(11)(i), comments were solicited from various Federal agencies with an actual or potential interest in the Virginia program. The Environmental Protection Agency (EPA) provided the only other comments received. OSM addressed EPA's comment in finding 17.(b).

V. Director's Decision

Based on the above findings, the Director is disapproving all of the proposed remining amendment as submitted by Virginia on December 22, 1987 and with subsequent revisions. The Director has determined this amendment not to be in accordance with SMCRA and inconsistent with Federal regulations. However, the proposed amendment may be revised, reorganized, and resubmitted if Virginia wishes to do so.

Effect of Director's Decision

Section 503 of SMCRA provides that a State may not exercise jurisdiction under SMCRA unless the State program is approved by the Secretary. Similarly, 30 CFR 732.17(g) prohibits unilateral changes to the approved State program. In his oversight of the Virginia program, the Director will recognize only the statutes, regulations, and other materials approved by him, together with any consistent implementing policies, directives, and other materials.

Dated: January 11, 1990.

Carl C. Close,

Assistant Director, Eastern Field Operations.

[FR Doc. 90-1429 Filed 1-22-90; 8:45 am]

BILLING CODE 4310-05-M

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[Docket No. AM015-WV-FRL-3716-3]

Approval and Promulgation of Implementation Plans; State of West Virginia; Stack Height Review

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: EPA is proposing to approve a declaration by West Virginia that the revision to EPA's stack height regulations does not necessitate a revision to the West Virginia State Implementation Plan (SIP) for any source except the Kammer power plant of Ohio Power. Following the promulgation of the revised stack height regulations, each state was required to review its SIP for consistency with the revised regulations. The intended effect of this action is to formally document that West Virginia has satisfied its obligation under section 406(d)(2) of the Clean Air Act Amendments of 1977 (the "Amendments").

DATE: Comments must be submitted by February 22, 1990.

ADDRESSES: Comments may be submitted to Joseph Kunz, Chief, Projects Management Section (3AM11), U.S. Environmental Protection Agency, 841 Chestnut Building, Philadelphia, Pennsylvania 19107. A copy of the West Virginia submission and EPA's evaluation is available for public inspection during normal business hours at the following locations:

TABLE 1.—WEST VIRGINIA STACK HEIGHT REVIEW—Continued

Company/Facility	Source	Ht. (FL)	Grandfather [1]	Formula	Other
Central/Philip Sporn	Units 1-4	800	<1952		
	Unit 5	602	1960		
App.Power/John Amos*	Units 1-2	903	1972		
	Unit 3	903	1973		
App.Power/Kanawha	Units 1-2	325	1953		
FMC/So. Charleston	Boiler 13-14	245	1930		
	Boiler 15-17	250	1935/6		
Mon/Power/Albright	Unit 3	226	1954		
Mon/Power/FL Martin	Unit 1	850	1967		
	Unit 2	550	1968		
Mon.Power/Harrison*	Units 1-2	1,000	1972/3		
	Units 2-3	1,000	1974		
WV Power/Mount Storm*	Units 1-2	743	1965/6		
	Unit 3	579	1973		
	Boiler 4	815		H+1.5L	+
Whig.Pitt./Follansbee*	#8 Combust	250		H+1.5L	+
Kaiser/Ravenswood	Pot Room	613			Not used.

[1] Date(s) shown are date of startup of commercial operation. Sources with dates after 1970 commenced construction prior to 12/3170.

TABLE 2—WEST VIRGINIA DISPERSION TECHNIQUES (D.T.) REVIEW

Company/Facility	Source	Allow. T/YR	Grandfather [2]	No Merged Streams	No Other D.T.
Koppers/Follansbee	Boilers	5,430	1940/61		
Mobay/New Martinsville	Boilers	13,439		X	X
Ohio Power/Kammer*	Units 1-3	192,642			
Ohio Power/Mitchell*	Units 1-2	482,994	1971		X
PPG/New Martinsville	Boilers	21,955	1952		
Weirton Steel		79,029		X	X
American Cyanamid/WI	Boilers	5,429	1948		
Dupont/Washington Works		11,333	1947-68		
Mon.Power/Pleasants	Units 1-2	65,700		X	X
Mon.Power/Willow Island	Units 1-2	31,221	1949/60		
Union Carbide/Sistersville		5,337	1955-68		
App.Power/Mountaineer	Unit 1	69,064		X	X
Central/Philip Sporn	Units 1-4	126,387	1950-52		X
Goodyear/Apple Grove	Boiler 2-3	5,919	1966		
App.Power/John Amos*	Units 1-3	190,715	1971/72		
App.Power/Kanawha	Units 1-2	27,332	1953		
DuPont/Belle Plant	Boilers 1-8	10,724	1937-45		
Elkem Metals/Alloy	Boilers 1-4	13,807	1933-50		
FMC/So. Charleston		9,280	1930-37		
Union Carbide/Institute	Boilers	25,026	1942-64		
Union Carbide/So. Charleston	Boilers	9,848	1937-54		
Mon.Power/Albright	Units 1-3	44,850	1952-54		
Mon.Power/FL Martin	Units 1-2	139,310	1967/68		
Mon.Power/Harrison*	Units 1-3	425,526	1972-74		
Mon.Power/Rivesville	Units 7-8	24,107	1944/51	X	X
WV Power/Mount Storm*	Units 1-3	207,132	1965-73		X
Martin Marietta/Martinsburg		29,183		X	
Whig.Pitt./Follansbee		19,022	1917-51		

[2] Date(s) shown are date of commercial operation startup. Sources with dates after 1970 commenced construction prior to 12/31/70.

Stack Height Remand

The EPA's stack height regulations were challenged in *NRDC* v. *Thomas*, 838 F.2d 1224 (DC Cir. 1988). On January 22, 1988, the U.S. Court of Appeals for the DC Circuit issued its decision affirming the regulations in large part, but remanding three provisions to the EPA for reconsideration. These are:

1. Grandfathering pre-October 11, 1983 within-formula stack height increases from demonstration requirements (40 CFR 51.100(kk)(2));

2. Dispersion credit for source originally designed and constructed with merged or multiflue stacks (40 CFR 51.100(hh)(2)(ii)(A)); and

3. Grandfathering pre-1979 use of the refined H + 1.5L formula (40 CFR 51.100(ii)(2)).

The EPA has reviewed the documentation of the sources and facilities listed in Tables 1 and 2 and determined that none of those sources or facilities have received credit under any of the provisions remanded to the EPA in *NRDC* v. *Thomas*, 838 F.2d 1224 (DC Cir 1988).

Proposed Action

EPA proposes to approve the declaration by West Virginia that the 1985 revision to EPA's stack height regulations necessitate a SIP revision for no source other than the Kammer power plant.

Under 5 U.S.C. Section 605(b), I certify that this revision will not have a significant economic impact on a substantial number of small entities. (see 46 FR 8709).

The Office of Management and Budget has exempted this rule from the requirements of Section 3 of Executive Order 12291.

List of Subjects in 40 CFR Part 52

Air pollution control, Sulfur oxides.

EXHIBIT B

the plan was incorrectly designated as (c). Instead this paragraph should have been designated as (d). USEPA regrets any inconvenience this error has caused.

In codifying this paragraph in the Code of Federal Regulations (1988) this portion of the plan disapproval was added at (c) in addition to the (c) paragraph (concerning Negative Declarations-Stationary Source Categories) which was already codified there on July 10, 1987 (52 FR 26010). Today, USEPA is correcting this error by changing the codification of paragraph (c) in the October 17, 1988, notice to paragraph (d).

Dated May 18, 1990.

Valdas V. Adamkus,

Regional Administrator.

PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS

Subpart O—Illinois

Title 40 of the Code of Federal Regulations, chapter I, part 52, is amended as follows:

1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401–7642.

§ 52.726 [Amended]

2. Section 52.726 is amended by redesignating paragraph (c) (which was inadvertently added on October 17, 1988 (53 FR 40426)) as paragraph (d).

[FR Doc. 90-12328 Filed 5-25-90; 8:45 am]

BILLING CODE 6560-50-M

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40 CFR Part 52

[A-1-FRL-3782-5]

Approval and Promulgation of Air Quality Implementation Plans, West Virginia; Stack Height Review

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: EPA is approving a declaration by the West Virginia Air Pollution Control Commission regarding the need to revise its State Implementation Plan (SIP) emission limitations in response to the federal stack height regulations promulgated on July 8, 1985. West Virginia has declared that the Kammer power plant, owned and operated by Ohio Power, is the only source for which it is necessary to revise the SIP to amend the allowable emission limitations. The intent of this action is to formally codify West Virginia's declaration at 40 CFR part 52, subpart XX, § 52.2534. This action is being taken in accordance with section 110 of the Clean Air Act.

EFFECTIVE DATE: This action will become effective on June 28, 1990.

ADDRESSES: Copies of the documents relevant to this action are available for public inspection during normal business hours at:

Air, Toxics and Radiation Management Division, U.S. Environmental Protection Agency, Region III, 841 Chestnut Building, Philadelphia, Pennsylvania 19107;

Public Information Reference Unit, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC.; and

West Virginia Air Pollution Control Commission, 1558 Washington Street, East, Charleston, West Virginia 25311.

FOR FURTHER INFORMATION CONTACT: Denis Lohman at the EPA address cited above or telephone (215) 597–8375; (FTS) 597–8375.

SUPPLEMENTARY INFORMATION: On July 8, 1985, EPA promulgated revisions to the regulations at 40 CFR 51.100 that limit stack height credits and other dispersion techniques (50 FR 27892).

Pursuant to section 406(d)(2) of the Clean Air Act Amendments, Public Law 95–95, all states must (1) review and revise, as necessary, their state implementation plans (SIPs) to include provisions that limit stack height credit and dispersion techniques in accordance with the revised regulations and (2) review all existing SIP emission limits to ascertain whether stack height credits above good engineering practice (GEP) or credit for other dispersion techniques, unacceptable under the revised regulations, were considered in setting any of these SIP limits. For any such SIP limits, states are required to adopt revised SIP limits for the affected sources consistent with the revised stack height regulations.

On April 30, 1988, the West Virginia Air Pollution Control Commission (WVAPCC) submitted an inventory of sources with stacks greater than 65 meters and facilities with allowable emissions of sulfur dioxide (SO_2) greater than 5000 tons per year. Based upon its preliminary review of source operation dates and configurations, the WVAPCC declared that none of the sources in the inventory, with the possible exception of the Kammer plant, were affected by the revised stack height regulations.

On September 16, 1988, the WVAPCC submitted a documentation package with detailed information on 32 stacks and 28 facilities. Supplemental information was submitted on three subsequent dates. On January 23, 1990 (55 FR 2245), EPA published a Notice of Proposed Rulemaking (NPR) for the State of West Virginia. The NPR proposed approval of the declaration by West Virginia that no SIP emission limits, other than the limit for the Kammer power plant, are required to be revised in response to the revised stack height regulations.

A summary of the information submitted by the WVAPCC was in the NPR. Other specific requirements of the stack height regulation and the rationale for EPA's proposed action were explained in the NPR and will not be restated here. No public comments were received on the NPR. An indepth description of the documentation and EPA's review of the declaration are provided in the Technical Support Document (TSD) prepared by EPA for this action. The TSD is available, upon request, from the EPA Regional Office listed in the Addresses section of this Notice.

Final Action

EPA approves the State of West Virginia's declaration that no existing SIP emission limits, other than those of the Kammer power plant, require revision as a result of the revisions to the federal stack height regulations promulgated on July 8, 1985.

This action is classified as a Table 3 action under the procedures published in the Federal Register on January 19, 1989 (54 FR 2214–2225). On January 6, 1989, the Office of Management and Budget waived Table 2 and 3 SIP revisions (54 FR 2222) from the requirements of section 3 of Executive Order 12291 for a period of two years.

Nothing in this action should be construed as permitting or allowing or establishing a precedent for any future request for revision to any state implementation plan. Each request for revision to the state implementation plan shall be considered separately in light of specific technical, economic, and environmental factors and in relation to relevant statutory and regulatory requirements.

Under section 307(b)(1) of the Clean Air Act, petitions for judicial review of this action, approving the stack height declaration by the State of West Virginia, must be filed in the United States Court of Appeals for the appropriate circuit by July 30, 1990. This action may not be challenged later in proceedings to enforce its requirements. (See section 307(b)(2).)

List of Subjects in 40 CFR Part 52

Air pollution control, Incorporation by reference, Intergovernmental relations.

EXHIBIT C

American Electric Power
Service Corporation
1 Riverside Plaza
Columbus, OH 43215
614 223 1000

Writer's Direct Dial No. (614) 223-1636

AEP
AMERICAN
ELECTRIC
POWER

Mr. Carl G. Beard
Director
West Virginia Air Pollution
Control Commission
1558 Washington Street East
Charleston, West Virginia 25311

December 27, 1988

Re: Kammer Plant

Dear Mr. Beard:

This letter supplements the factual information contained in American Electric Power's (AEP) letter of July 7, 1988, in which AEP addressed outstanding issues regarding sulfur dioxide (SO_2) emission limitations for Ohio Power Company's Kammer Plant. Based on the discussion below, AEP respectfully urges that a 60-day period be granted by the West Virginia Air Pollution Control Commission to allow for completion of a formal compliance demonstration for Kammer Plant SO_2 emission limitations. This letter is not intended to withdraw the July 7th letter nor is it to be viewed a departure from AEP's conviction that appropriate application of U.S. EPA's "emissions balancing" policy, 53 Fed. Reg. 480 (Jan. 7, 1988), can lead to a satisfactory resolution of outstanding SO_2 issues.

Despite a disappointing lack of success in obtaining U.S. EPA assent to the July 7th proposal, subsequent events suggest avenues for dealing with these outstanding issues that do not require utilization of the emissions balancing policy. The avenue that bears the most promise is performing a compliance demonstration at Kammer Plant using refined dispersion modeling.

Background.--Rules issued by U.S. EPA on July 8, 1985, 50 Fed. Reg. 27892, have had the legal effect of retroactively denying dispersion credit for the full 900' height of the stack which serves the three units of Ohio Power's 630-MW Kammer Plant. The 1985 stack height rules make it clear, however, that Ohio Power is lawfully entitled to claim credit for a stack height of 600' at Kammer, on the basis that original 600' stacks were "in existence" long before the Clean Air Act's grandfather date of December 31, 1970. Additionally, analysis of historical records indicates that Ohio Power is entitled to claim dispersion credit for "flue gas merger," the combination of the two original Kammer Plant stacks into the present 900' stack during

prediction of 189 ug/m^3.[1] We stress that, while this analysis was extensive, it does not incorporate all the refinements of U.S. EPA's required modeling methodology for purposes of establishing SO_2 emission limitations. We also stress that although the modeling addresses the potential contribution of Ohio Edison's Burger Plant to "plume interactions," the focus of AEP's proposed compliance demonstration is upon Kammer Plant.

Equally extensive modeling indicates that SO_2 emissions from Kammer can be increased to at least 6.8 pounds SO_2 without violating applicable SO_2 NAAQS. The results, which are tabulated in the attached summary, again indicate that the 3-hour and 24-hour SO_2 NAAQS are comfortably met - highest, second-maximum 3-hour prediction of 866 ug/m^3 and highest, second-maximum 24-hour prediction of 271 ug/m^3.[2] While extremely encouraging, these results do not in and of themselves constitute proof that a 6.8 pounds SO_2 emission limitation would be supported if a refined modeling analysis were conducted, i.e., when additional receptors in the vicinity of high predicted concentrations are included. Additionally, no background SO_2 concentration level has been factored into this preliminary analysis. Nevertheless, these results in our judgment warrant refined modeling to determine whether an emission limitation for Kammer in the range of 6.8 pounds can be justified. AEP believes that a period of 60 days from December 28th is adequate to perform refined modeling of Kammer necessary to determine a maximum SO_2 emission rate that is consistent with applicable NAAQS and to address critical ancillary issues such as ambient background SO_2 concentrations.

Flue-Gas Merging.--Another of the critical ancillary issues that is brought to the fore by EPA's 1985 stack height rules is the extent to which credit can be extended to the increased dispersion associated with flue gas merging. 40 C.F.R. 51.100(hh)(1)(C), as promulgated in 50 Fed. Reg. 27906, indicates that flue gas merging is creditable when accomplished in connection with pollution control equipment retrofit and when an increase in emissions does not take place:

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[1] A full set of MES tables of the 4.5 pound computer "run" is attached as Enclosure 1.

[2] A full set of MES tables of the 6.8 pound computer "run" is attached as Enclosure 2.

pounds on a 24-hour basis is necessary to provide electric energy to Ormet at a price that will allow its product to remain competitive in world aluminum markets. Likewise, an emission limitation below 5.8 pounds SO_2 could jeopardize the continued operation of the Ireland Mine, and with it, more than 200 jobs. While much more can be said about the significance of the Ormet payroll to the regional economy, it is sufficient to indicate that loss of Ormet would be a crippling blow to the hard-pressed Ohio Valley. On the other hand, a 5.8 pounds limitation will permit continued Ireland Mine output at current long-term contract levels.

It is AEP's hope that further modeling will justify a 5.8 pounds SO_2 emission limitation at Kammer. We nonetheless recognize that the emissions balancing policy is available to support a 5.8 pound emission rate at Kammer even if dispersion modeling based on 600' stack height assumption cannot. This was recognized in a Region III letter dated August 6, 1988 to Allan L. Maxwell, a concerned Ohio Valley citizen:

> "Ohio Power can elect to evaluate an emission limit for Kammer at the grandfathered stack height of 600-feet. If Ohio Power would choose this option, it is likely that only a relatively small emissions reduction at Kammer would be required. After an emission reduction requirement has been determined, Ohio Power can choose to request approval of an emissions balance." [Emphasis added.] (Copy attached as Enclosure 4.)

Conclusion.--Enclosed is a summary table indicating the present status of dispersion modeling and a listing of issues that can be addressed within the next 60 days. AEP respectfully urges that the West Virginia Air Pollution Control Commission designate a 60-day period in which the present encouraging modeling analysis can be refined.

If this letter raises any questions, please contact the undersigned at 614/223-1636.

Sincerely,

J. P. White

JPW/mac
Enclosures

III. Unanswered Questions

-- What Kammer SO_2 emission limitation can be justified when refined model methodology is employed?

-- What justification can be offered for crediting dispersion from Kammer's single "merged" stack?

-- What is an appropriate "background" SO_2 concentration to add to predicted concentrations?

TABLE 1

UTILITY-STACK PARAMETERS AND EMISSION CHARACTERISTICS

	Kammer			Mitchell	Burger
Load (%)	100	75	50	100	100
Stack Height (m)	182.9	182.9	182.9	367.1	258.1
Stack Diameter (m)	7.01	7.01	7.01	9.15	6.55
Exit Velocity (m/sec)	34.50	25.88	17.25	48.0	30.47
Exit Temperature (°K)	440	440	440	440	446
Emission Rate (g/sec)	3667.3	2750.5	1833.7	13280.0	7452.0
lbs/10^6 BTU	4.5	4.5	4.5	7.5	---
Easting	515.5	515.5	515.5	515.8	520.5
Northing	4410.5	4410.5	4410.5	4408.7	4417.5
Base Elev. (m)	195.1	195.1	195.1	207.3	201.2

METEOROLOGICAL EVALUATION SERVICES

TABLE 3

SUMMARY OF THE KAMMER 600-FT GEP STACK HEIGHT ISCST MODELING
KAMMER, MITCHELL AND BURGER - 100% LOADS
PITTSBURGH/PITTSBURGH METEOROLOGICAL DATA

		Twenty-Four Hour								
Year	Ring Set	Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Highest 2nd-Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Annual ($\mu g/m^3$)
1982	1	150.0	220	1.4	210	125.4	220	1.6	225	5.0
	2	229.6	220	3.0	225	166.8	210	2.6	225	8.6
	3	280.0	220	3.5	225	167.9	90	7.5	112	19.8
1983	1	109.8	210	1.6	164	90.3	110	1.6	209	4.1
	2	120.2	60	3.0	206	105.3	70	3.0	244	8.4
	3	214.4	150	10.0	176	174.9	190	10.0	244	18.1
1984	1	170.2	240	1.5	211	76.2	110	1.6	233	5.1
	2	181.0	210	2.8	211	116.2	230	2.8	265	8.1
	3	260.9	30	7.5	211	189.8	30	7.5	210	18.1
1985	1	144.4	350	1.5	131	106.2	340	1.2	194	5.0
	2	160.5	310	2.6	214	126.8	280	2.8	211	9.2
	3	216.3	230	4.8	214	169.2	190	10.0	178	20.0
1986	1	114.4	10	1.6	172	92.1	360	1.5	231	4.2
	2	131.8	120	3.0	212	112.6	110	3.0	230	11.1
	3	232.7	190	10.0	230	161.7	190	10.0	145	19.8
OVERHALL		280.0	220	3.5	225	189.8	30	7.5	210	20.0

Ring Set 1 = 1.0, 1.2, 1.4, 1.5, and 1.6 km
Ring Set 2 = 2.0, 2.2, 2.4, 2.6, and 2.8 km
Ring Set 3 = 3.0, 3.5, 4.8, 7.5, and 10.0 km

METEOROLOGICAL EVALUATION SERVICES

TABLE 5

SUMMARY OF THE KAMMER 600-FT GEP STACK HEIGHT ISCST MODELING
KAMMER - 75% LOAD
MITCHELL AND BURGER - 100% LOADS
PITTSBURGH/PITTSBURGH METEOROLOGICAL DATA

		Twenty-Four Hour								
Year	Ring Set	Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Highest 2nd-Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Annual ($\mu g/m^3$)
1982	1	135.5	330	1.0	225	123.7	220	1.6	210	5.2
	2	249.0	220	3.0	225	172.7	210	2.6	196	10.0
	3	297.6	220	3.5	225	164.9	90	7.5	112	20.4
1983	1	100.3	210	1.6	164	90.3	110	1.6	209	4.4
	2	121.2	200	2.8	159	116.1	200	2.8	244	9.7
	3	213.7	150	10.0	176	169.7	190	10.0	244	18.9
1984	1	152.2	240	1.4	211	136.7	250	1.6	210	5.2
	2	180.8	210	2.8	211	140.2	220	3.0	173	9.4
	3	260.9	30	7.5	211	189.8	30	7.5	210	18.5
1985	1	131.4	350	1.4	131	109.2	340	1.2	194	5.1
	2	166.7	230	3.0	214	126.8	280	2.8	211	10.7
	3	211.3	230	3.5	214	174.6	230	10.0	211	20.4
1986	1	109.3	10	1.4	172	92.1	360	1.5	231	5.0
	2	138.4	120	3.0	212	118.7	110	3.0	212	12.7
	3	220.0	190	10.0	230	157.7	190	10.0	145	20.1
OVERALL		297.6	220	3.5	225	189.8	30	7.5	210	20.4

Ring Set 1 = 1.0, 1.2, 1.4, 1.5, and 1.6 km
Ring Set 2 = 2.0, 2.2, 2.4, 2.6, and 2.8 km
Ring Set 3 = 3.0, 3.5, 4.8, 7.5, and 10.0 km

METEOROLOGICAL EVALUATION SERVICES

TABLE 7

SUMMARY OF THE KAMMER 600-FT GEP STACK HEIGHT ISCST MODELING
KAMMER - 50% LOAD
MITCHELL AND BURGER - 100% LOADS
PITTSBURGH/PITTSBURGH METEOROLOGICAL DATA

Year	Ring Set	Twenty-Four Hour Highest				Twenty-Four Hour Highest 2nd-Highest				Annual
		($\mu g/m^3$)	(°)	(km)	Day	($\mu g/m^3$)	(°)	(km)	Day	($\mu g/m^3$)
1982	1	143.3	220	1.6	225	109.3	220	1.4	210	5.6
	2	271.2	220	3.0	225	177.4	210	2.6	196	12.4
	3	312.9	220	3.5	225	158.5	230	3.5	196	20.6
1983	1	97.3	110	1.6	206	90.3	110	1.6	209	6.6
	2	147.8	200	2.8	159	130.2	200	2.8	244	12.1
	3	196.1	60	5.2	159	163.3	190	10.0	244	19.3
1984	1	141.6	240	1.2	211	119.5	250	1.6	211	5.9
	2	187.7	210	2.8	211	142.2	220	3.0	211	12.0
	3	260.9	30	7.5	211	189.8	30	7.5	210	19.6
1985	1	122.5	350	1.2	131	115.0	340	1.2	131	7.3
	2	181.1	230	3.0	214	142.3	320	2.6	214	13.3
	3	206.4	230	3.5	214	179.5	50	4.8	21	21.5
1986	1	105.0	10	1.2	172	92.1	360	1.5	231	7.5
	2	173.7	110	3.0	66	122.2	110	3.0	212	15.8
	3	201.9	190	10.0	230	153.6	50	10.0	149	20.1
OVERALL		312.9	220	3.5	225	189.8	30	7.5	210	21.5

Ring Set 1 = 1.0, 1.2, 1.4, 1.5, and 1.6 km
Ring Set 2 = 2.0, 2.2, 2.4, 2.6, and 2.8 km
Ring Set 3 = 3.0, 3.5, 4.8, 7.5, and 10.0 km

METEOROLOGICAL EVALUATION SERVICES

TABLE 9

KAMMER, MITCHELL AND BURGER CONTRIBUTIONS TO

THE HIGHEST, SECOND-HIGHEST 3- AND 24-HOUR CONCENTRATIONS

HIGHEST, SECOND-HIGHEST 3-HOUR CONCENTRATION

Year 1984, Day 212, Period 5
Bearing 30° at 7.5 km
Concentration = 808.6 $\mu g/m^3$

Kammer	=	0.0 $\mu g/m^3$
Mitchell	=	0.0 $\mu g/m^3$
Burger	=	808.6 $\mu g/m^3$
Total	=	808.6 $\mu g/m^3$

HIGHEST, SECOND-HIGHEST 24-HOUR CONCENTRATION

Year 1984, Day 210
Bearing 30° at 7.5 km
Concentration = 189.8 $\mu g/m^3$

Kammer	=	0.0 $\mu g/m^3$
Mitchell	=	0.0 $\mu g/m^3$
Burger	=	189.8 $\mu g/m^3$
Total	=	189.8 $\mu g/m^3$

METEOROLOGICAL EVALUATION SERVICES

FIGURE 1

UTILITY-STACK PARAMETERS AND EMISSION CHARACTERISTICS

	Kammer			Mitchell	Burger
Load (%)	100	75	50	100	100
Stack Height (m)	182.9	182.9	182.9	367.1	258.1
Stack Diameter (m)	7.01	7.01	7.01	9.15	6.55
Exit Velocity (m/sec)	34.50	25.88	17.25	48.0	30.47
Exit Temperature (°K)	440	440	440	440	446
Emission Rate (g/sec)	5541.7	4156.3	2770.9	13280.0	7452.0
lbs/10^6 BTU	6.8	6.8	6.8	7.5	---
Easting	515.5	515.5	515.5	515.8	520.5
Northing	4410.5	4410.5	4410.5	4408.7	4417.5
Base Elev. (m)	195.1	195.1	195.1	207.3	201.2

METEOROLOGICAL EVALUATION SERVICES

FIGURE 3

SUMMARY OF THE KAMMER 600-FT GEP STACK HEIGHT ISCST MODELING
KAMMER, MITCHELL AND BURGER - 100% LOADS
PITTSBURGH/PITTSBURGH METEOROLOGICAL DATA

		Twenty-Four Hour								
Year	Ring Set	Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Highest 2nd-Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Annual ($\mu g/m^3$)
1982	1	197.7	220	1.4	210	129.1	360	1.5	225	6.0
	2	279.5	220	3.0	225	185.1	210	2.6	196	11.5
	3	346.3	220	4.8	225	211.2	90	7.5	129	25.3
1983	1	143.3	210	1.6	164	106.4	200	1.6	164	5.1
	2	162.6	200	2.8	159	145.8	200	2.8	244	11.2
	3	261.9	150	7.5	176	215.5	180	7.5	257	22.6
1984	1	230.7	240	1.5	211	112.4	260	1.5	212	6.2
	2	208.0	210	2.8	211	151.4	220	3.0	173	11.0
	3	295.7	230	7.5	265	209.3	220	10.0	173	22.4
1985	1	187.3	350	1.5	131	127.7	340	1.2	194	6.0
	2	224.4	230	3.0	214	163.0	200	2.8	208	12.2
	3	302.2	230	4.8	214	226.7	230	10.0	211	25.7
1986	1	155.0	120	1.4	216	109.2	360	1.5	205	5.2
	2	168.0	290	3.0	225	148.4	110	3.0	212	15.3
	3	292.5	190	10.0	230	210.3	50	4.8	173	24.3
OVERHALL		346.3	220	4.8	225	226.7	230	10.0	211	25.7

Ring Set 1 = 1.0, 1.2, 1.4, 1.5, and 1.6 km
Ring Set 2 = 2.0, 2.2, 2.4, 2.6, and 2.8 km
Ring Set 3 = 3.0, 3.5, 4.8, 7.5, and 10.0 km

METEOROLOGICAL EVALUATION SERVICES

FIGURE 5

SUMMARY OF THE KAMMER 600-FT GEP STACK HEIGHT ISCST MODELING
KAMMER - 75% LOAD
MITCHELL AND BURGER - 100% LOADS
PITTSBURGH/PITTSBURGH METEOROLOGICAL DATA

		Twenty-Four Hour								
Year	Ring Set	Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Highest 2nd-Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Annual ($\mu g/m^3$)
1982	1	170.4	220	1.4	210	134.7	220	1.6	225	6.2
	2	308.7	220	3.0	225	209.6	210	2.6	225	13.7
	3	371.3	220	3.5	225	219.1	60	4.8	10	26.2
1983	1	129.0	210	1.6	164	96.8	200	1.6	164	5.5
	2	179.7	200	2.8	159	163.0	200	2.8	244	13.3
	3	262.7	150	7.5	176	211.4	180	7.5	159	23.8
1984	1	203.4	240	1.4	211	178.6	250	1.6	210	6.5
	2	207.7	210	2.8	211	166.3	220	3.0	211	13.0
	3	289.5	230	7.5	265	206.4	220	10.0	231	23.4
1985	1	167.3	350	1.4	131	132.3	340	1.2	194	6.2
	2	240.8	230	3.0	214	176.0	200	2.8	208	14.5
	3	297.7	230	3.5	214	240.5	230	10.0	211	27.2
1986	1	125.2	120	1.4	216	102.3	110	1.6	149	6.4
	2	186.1	110	3.0	66	156.4	110	3.0	212	17.7
	3	273.3	190	10.0	230	196.6	60	10.0	216	24.8
OVERALL		371.3	220	3.5	225	240.5	230	10.0	211	27.2

Ring Set 1 = 1.0, 1.2, 1.4, 1.5, and 1.6 km
Ring Set 2 = 2.0, 2.2, 2.4, 2.6, and 2.8 km
Ring Set 3 = 3.0, 3.5, 4.8, 7.5, and 10.0 km

METEOROLOGICAL EVALUATION SERVICES

FIGURE 7

SUMMARY OF THE KAMMER 600-FT GEP STACK HEIGHT ISCST MODELING
KAMMER - 50% LOAD
MITCHELL AND BURGER - 100% LOADS
PITTSBURGH/PITTSBURGH METEOROLOGICAL DATA

Year	Ring Set	Twenty-Four Hour Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Twenty-Four Hour Highest 2nd-Highest ($\mu g/m^3$)	Bear. (°)	Dist. (km)	Day	Annual ($\mu g/m^3$)
1982	1	154.4	220	1.6	225	129.9	220	1.6	210	7.4
	2	342.3	220	3.0	225	231.8	210	2.6	225	17.3
	3	394.3	220	3.5	225	223.1	60	4.8	10	26.5
1983	1	122.2	330	1.2	104	99.7	140	1.6	176	8.7
	2	222.9	110	3.0	110	185.1	120	3.0	197	16.9
	3	252.8	90	5.2	253	205.9	50	4.8	333	25.2
1984	1	186.9	240	1.2	211	153.3	250	1.6	210	7.8
	2	236.7	230	3.0	265	169.7	110	3.0	60	16.9
	3	285.4	230	4.8	265	198.1	220	3.5	211	25.6
1985	1	153.0	350	1.2	131	143.6	340	1.2	131	9.6
	2	262.6	230	3.0	214	190.1	230	3.0	211	18.3
	3	290.3	230	3.5	214	271.2	50	4.8	21	30.0
1986	1	118.3	10	1.2	172	100.2	350	1.6	218	10.2
	2	262.5	110	3.0	66	165.1	110	3.0	249	22.3
	3	278.1	110	3.5	66	189.2	60	4.8	269	25.6
OVERALL		394.3	220	3.5	225	271.2	50	4.8	21	30.0

Ring Set 1 = 1.0, 1.2, 1.4, 1.5, and 1.6 km
Ring Set 2 = 2.0, 2.2, 2.4, 2.6, and 2.8 km
Ring Set 3 = 3.0, 3.5, 4.8, 7.5, and 10.0 km

METEOROLOGICAL EVALUATION SERVICES

FIGURE 9

KAMMER, MITCHELL AND BURGER CONTRIBUTIONS TO

THE HIGHEST, SECOND-HIGHEST 3- AND 24-HOUR CONCENTRATIONS

HIGHEST, SECOND-HIGHEST 3-HOUR CONCENTRATION

Year 1984, Day 265 Period 7
Bearing 230° at 7.5 km
Concentration = 865.5 $\mu g/m^3$

Kammer = 865.3 $\mu g/m^3$
Mitchell = 0.0 $\mu g/m^3$
Burger = 0.2 $\mu g/m^3$

Total = 865.5 $\mu g/m^3$

HIGHEST, SECOND-HIGHEST 24-HOUR CONCENTRATION

Year 1985, Day 21
Bearing 50° at 4.8 km
Concentration = 271.2 $\mu g/m^3$

Kammer = 271.0 $\mu g/m^3$
Mitchell = 0.2 $\mu g/m^3$
Burger = 0.0 $\mu g/m^3$

Total = 271.2 $\mu g/m^3$

METEOROLOGICAL EVALUATION SERVICES

EXHIBIT D

RECEIVED
90 APR 30
WEST VIRGINIA
AIR POLLUTION
CONTROL COMMISSION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

4/26/90

Mr. G. Dale Farley, Director
Air Pollution Control Commission
1558 Washington Street, East
Charleston, West Virginia 25311

APR 27 '90

Dear Mr. Farley:

In my letter, dated February 22, 1990, providing additional detail concerning the sulfur dioxide (SO_2) SIP call, I stated that Region III was developing an action plan to address SO_2 issues in West Virginia. We have completed the plan and we believe it establishes reasonable timeframes for addressing the predominant SO_2 problems in West Virginia.

The action plans developed by EPA for four areas in West Virginia are enclosed for your use. If you wish to discuss these plans, please contact me or Marcia Spink at (215) 597-9075.

Sincerely,

Thomas J. Maslany, Director
Air, Toxics and Radiation
Management Division

Enclosure

Each of the modeling analyses referred to above, is claimed to demonstrate attainment of the NAAQS although each analysis contains a mutually exclusive set of sources. In order to provide an acceptable demonstration that the NAAQS will be maintained, the two modeling analyses must be combined to consider the total impact of all sources or, alternatively, there must be a demonstration that there is no "significant" interaction between the sources.

CONTROL STRATEGY DEVELOPMENT

EMISSION INVENTORY: In addition to the sources identified above, the Cardinal Power Plant, located about 50 kilometers to the north, and potentially significant minor sources should be evaluated by the APCC. One source which should be considered is the PPG facility, about 11 kilometers south of Kammer. For all sources considered, the allowable emission rates must be determined in accordance with Table 9-1 of the GAQM.

METEOROLOGICAL DATA: All of the power plant sources have stack heights which are sufficiently high enough to qualify as "simple terrain" sources. For those sources, the meteorological data from the nearest National Weather Service station (Greater Pittsburgh) is acceptable. The GAQM, however, requires site-specific data for the low-level sources which, because of their relatively short stack heights, are located in "complex terrain."

Meteorological data was monitored at the Columbian Chemical facility for the period 1983 - 1987. The site was visited by the Region III lead meteorologist and was tentatively found to be representative for the area. The data must be reviewed to ensure that it meets quality assurance requirements before it can be proposed for use in setting emission limits. If the Columbian Chemical data cannot be used a program of on-site meteorological data monitoring must be started.

ISSUES

Both Ohio Power, the owner of Kammer and Mitchell, and BP Oil have submitted studies to demonstrate attainment. Each study has been deficient, in part because each study failed to consider the other "class" of sources (high or low-level). The major obstacle to a resolution is the meteorological requirements for each type of source. The high-level sources can be evaluated using National Weather Service data (Pittsburgh). The low-level sources must have on-site data for the complex terrain modeling.

The most conservative approach to combining the two studies is to add the maximum impacts at each receptor. Another, but still conservative, approach is to treat the high-level sources as background sources, and model the low-level sources with on-site meteorological data.

SCHEDULE

Evaluate quality of met. data	7/15/90
If necessary, begin on-site data	9/30/90
Emission Inventory	9/30/90
Modeling Protocol	10/31/90
Complete Modeling[1]	12/31/90
Evaluate Control Strategies	2/28/91
Select Emission Limits	3/31/91
Draft Regulations	
Emission Standards	4/15/91
Compliance Method(s)	5/31/91
Projection of Compliance Date	6/30/91
Public Hearing	8/31/91
Adopt Regulations	2/29/92
Submit SIP Revision	3/31/92

[1]If met data collection is required, add one-year to schedule.

TABLE 5

RTDM DEFAULT MODE PREDICTIONS OF SO2 CONCENTRATIONS, 1983-1987
(Concentrations in micrograms per cubic meter)

BP OIL AND COLUMBIAN CHEMICALS COMBINED, 465 RECEPTORS

3-HOUR CONCENTRATIONS					24-HOUR CONCENTRATIONS			
	DAY	END HR	REC	CONC.		DAY	REC	CONC.
83, H2H	44	24	77r	1157.7	83, H2H	76	77r	308.9
84, H2H	103	24	83r	1096.3	84, H2H	284	77r	274.1
85, H2H	107	3	5r	993.3	85, H2H	117	83r	283.3
86, H2H	113	24	60r	1251.7	86, H2H	120	77r	335.8
87, H2H	223	6	19r	1214.4	87, H2H	292	77r	299.1

Highest annual concentration is 63.4 ug/m^3 in the year 1986 (rec #26).

r: Refined receptor point.

H2H: Highest of the second high.

ATTACHMENT 3-4

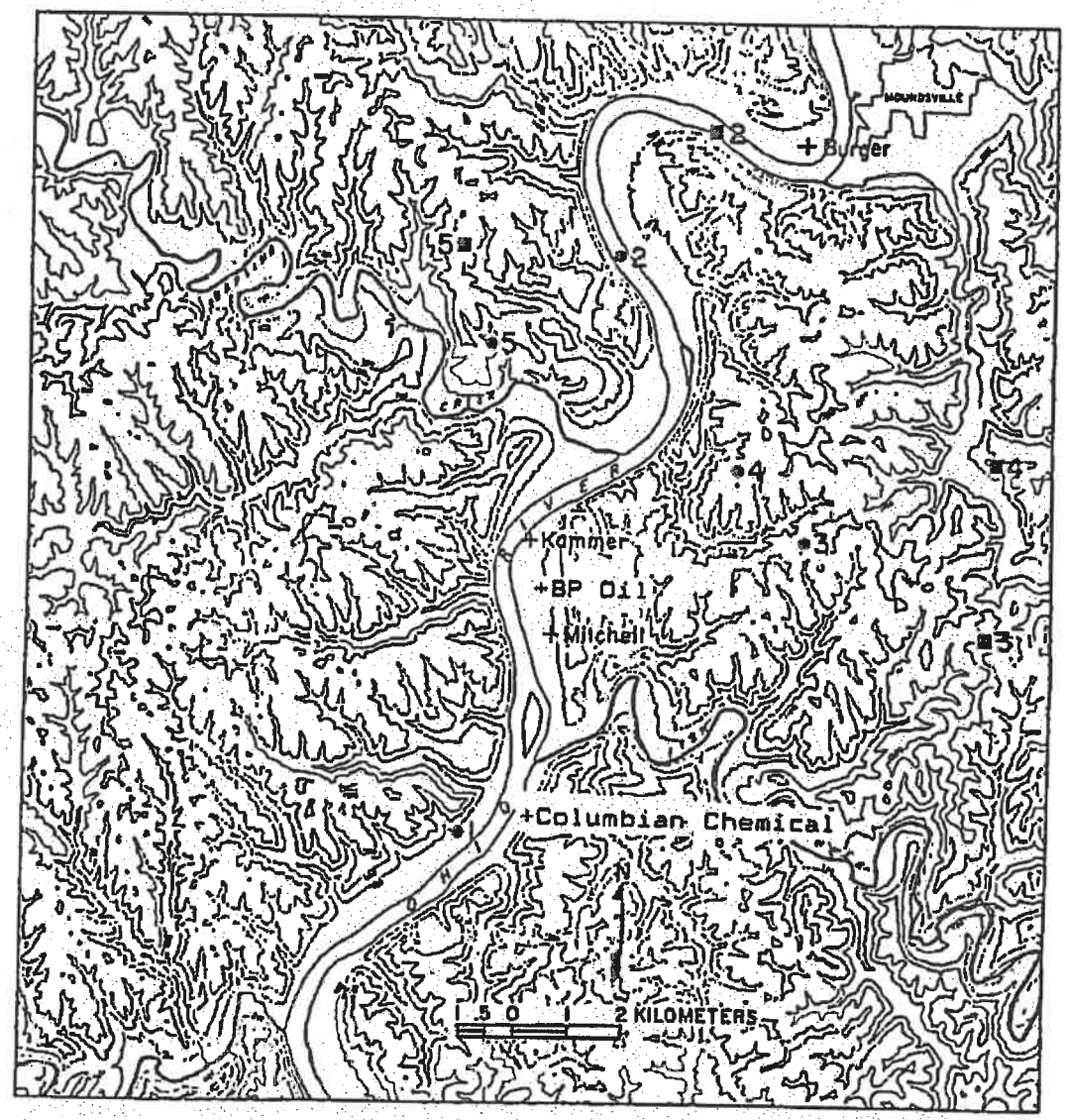


FIGURE 4-1. Topographic map of the area surrounding the Mitchell and Kammer Power Plants showing the locations of the calculated maximum ground-level SO_2 concentrations produced by emissions from the Kammer Power Plant (filled circles) and the Mitchell Power Plant (filled squares). The numbers refer to the cases in Table 4-1.

EXHIBIT E

To: David Flannery
From: J.P. White

D.C. Wm.
FYI
SDS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

AUG 5 1988

Mr. Allan L. Maxwell
118 Graham Avenue
Sistersville, West Virginia 26175

Dear Mr. Maxwell:

Thank you for your interesting and thoughtful letter to Administrator Thomas concerning the rulings on the Kammer Plant of Ohio Power Company. Because the Kammer Plant is in EPA's Region III, your letter has been referred to me for response.

When Congress enacted the stack height provisions of the Clean Air Act in 1977, they were specified to apply to all stack heights coming into existence after 1970. Because the 900-foot stack at Kammer did not exist on January 1, 1971, EPA ruled that the stack height regulations, implementing the Clean Air Act, did apply to Kammer. Subsequent court decisions have required EPA to change the regulations and the changed regulations still must apply to Kammer. Other Court opinions have specifically ruled that EPA acted properly with respect to Kammer.

The construction of the 900-foot stack at Kammer was not directed by EPA but an elected choice of the company to accommodate new construction of pollution control equipment. Ohio Power was required to install equipment to control particulate matter emissions and chose, for the sake of economics, to build one stack. Then Ohio Power decided to make that one stack 300-feet higher than the two existing stacks. After construction had begun, Congress enacted the stack height provision and Ohio Power asked for guidance in obtaining credit for the tall stack. At the time, EPA had no rules for the wind tunnel study. The Ohio Power wind tunnel demonstration for Kammer, which was the first such study in the nation, was performed with the best guidance EPA could provide at the time. Unfortunately, it did not fully conform with the final rules promulgated on July 8, 1985.

AUG 26 '88 11:58 FROM R.E.P.S.C. LEGAL PAGE.001/002

EXHIBIT F

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

MAY 05 1998

Mr. Tim J. Carroll
Environmental Resource Program Manger
Office of Air Quality
Northern Panhandle Office
1911 Warwood Avenue
Wheeling, WV 26003

Dear Mr. Carroll:

The Environmental Protection Agency (EPA) has reviewed the April 1998, amended *Dispersion Model Protocol for Industrial Source Group Based in Marshall County, West Virginia,* as prepared by Energy and Environmental Management, Inc. With the clarifications, summarized below, obtained in the April 30, 1998, telephone conversation between Denis Lohman and Larry Simmons and the modifications received on May 4, 1998, the protocol is considered to satisfy the requirements of Appendix W to 40 CFR Part 51 otherwise known as the Guideline on Air Quality Models (GAQM).

In the final paragraph of section 4.4 RECEPTOR SELECTION on page 4-9, the "limited" access to property which exempts the property from being considered ambient air, for the source which owns and controls the property, must include a physical barrier.

The reference to "informational purposes" in a footnote to Table 8 on page 4-16 is superfluous in that all of the modeling performed by the ISG is only for the purpose of providing information to the State which has the statutory obligation to develop the state implementation plan (SIP). EPA must ensure that stack heights used to establish SIP emission limits do not exceed the height specified in 40 CFR 51.100 (ii). Because there is the possibility that the 900-foot stack height at Kammer will be found to be creditable, EPA does not object to that height being modeled in addition to the 600-foot height. There is, of course, the somewhat unlikely possibility that some intermediate height is established as the creditable stack height. In that event the modeling for Kammer would need to be redone.

The data requirements of Table 9-1 of GAQM relative to the sources listed in Tables 8 and 9 are under development and will be provided in sufficient time to verify the modeled emission rates prior to the emission limits being specified in a SIP revision request.

Section 4.9.3 POST-PROCESSING is only a brief and overly simplified description of the source contribution evaluation procedures which will establish the correct design concentration for each source being evaluated.

EXHIBIT G

From: <gjwooten@aep.com>
To: <rbetterton@wvdep.org>
Date: 2/23/2006 4:03:17 PM
Subject: WV BART Information Request - AEP

Bob,
Per your request, attached are electronic copies of the PTE BART spreadsheets for Ohio Power Company's Mitchell Plant and Appalachian Power Company's Mountaineer and Amos Plant. Certified hardcopies will follow via the U.S. Postal Service.

(See attached file: PTE SS R0 ML 2006.xls)(See attached file: PTE SS R0 MT 2006.xls)(See attached file: PTE SS R0 AM 2006.xls)

Let me know if you have any questions.

Greg Wooten
Air Quality Services Section

CC: <jpnovotny@aep.com>, <padalporto@aep.com>

Enclosure 1

STACK DATA

Company/Facility: Ohio Power Company, Mitchell Plant

	Stack Identification		HOURLY BASIS Potential to Emit (PTE) from Stacks (Pounds/Hour)				OPTIONAL DATAParticulate Matter Size Distribution						
BART Unit Cross Reference ID	Stack ID	Stack Description	SO2	NOX	PM10	NH3	geometric mass mean diameter	6-10 µm	2.5-6 µm	1.25-2.5 µm	1.0-1.25 µm	0.625-1.0 µm	0.5-0.625 µm
	CS012	Mitchell Unit 1&2 Common Stack	124185	8279	470.3	0.7		17%	21%	12%	3%	2%	
	ML1	Flue 1:New Mitchell Unit 1&2 Stack	62092.5	4139.5	235.2	0.4		17%	21%	12%	3%	2%	
	ML2	Flue 2:New Mitchell Unit 1&2 Stack	62092.5	4139.5	235.2	0.4		17%	21%	12%	3%	2%	
		(2 Flues in One Liner)											
	Aux ML1		2055.3	119.4	29.9	4.0		20%	18%	3%	1%	6%	
								Size Distribution Data per AP-42					

VISTAS BART subgroup to resolve technical issues spanning states in the VISTAS region; and ongoing consultation with affected sources, EPA and FLMs throughout the BART process.

7.3. Identification of BART-eligible Sources

EPA provided guidance for identifying BART-eligible sources in 40 CFR Part 51 Appendix Y. West Virginia followed this guidance in identifying its BART-eligible sources. The West Virginia 2002 air emissions inventory was reviewed to determine the population of potential BART-eligible sources. The data were initially queried for any sources emitting SO_2, NOx, PM-10, VOC, or ammonia, based upon the Standard Industrial Classification and the Source Classification Code. The data set was refined based on emissions, whether emission units fit in any of the twenty-six listed source categories for BART, and available date information obtained through review of permit and inspection reports and discussion with permits section and regional office staff familiar with the facilities.

An information packet on BART was sent to and additional information was collected from the remaining sources regarding potential emissions and BART eligibility from the standpoint of source category and date criteria. Through this iterative review process, the list of potential BART-eligible sources was pared down to the twenty-two BART-eligible sources listed below.

Table 7.3-1. BART-Eligible Sources in West Virginia

Facility Name	Facility ID	Location
Allegheny Energy - Ft. Martin	061-00001	Maidsville
Allegheny Energy - Harrison	033-00015	Haywood
Allegheny Energy - Pleasants	073-00005	Willow Island
AEP - Appalachian Power - John Amos	079-00006	St. Albans
AEP - Ohio Power - Mitchell	051-00005	Moundsville
AEP - Appalachian Power - Mountaineer	053-00009	New Haven
Bayer Material Science	051-00009	New Martinsville
Cabot Corp	073-00006	Waverly
Capitol Cement Corporation	003-00006	Martinsburg
Century Aluminum	035-00002	Ravenswood
Clearon Corporation	039-00011	South Charleston
Columbian Chemicals	051-00019	Moundsville
Dominion - Mt. Storm	023-00003	Mt. Storm
Dupont	039-00001	Belle
Kepler Processing	109-00013	Pineville

Putting all this together, it appears that "causing" visibility impairment means having a humanly perceptible impact (for which EPA considers the practical threshold to be 1.0 dv) while "contributing" to visibility impairment means having a smaller impact (for which EPA considers the threshold to be 0.5 dv or some smaller value) that may or may not be perceptible.

The EPA argues that a contribution threshold of less than 0.5 dv impact per source is appropriate when multiple sources contribute, in order to limit the combined effect of these sources. As an example, EPA asserts that if there were 100 sources, each affecting visibility by 0.1 dv (presumably an imperceptible amount), their total impact would be 10 dv (which can be expected to be quite perceptible). The point remains that multiple sources can cause a larger impact than a single one. For BART purposes, visibility impacts are calculated as 24-hr averages of 1-hr plume impacts, so if the plumes from the various sources each impact the point of interest at some time during a 24-hr period (not necessarily all at the same hour) then the 24-hr average will reflect their combined impact.

WV DAQ concluded that the EPA suggested contribution threshold of 0.5 dv was appropriate in this situation since there are a limited number of out of state sources that impact the various Class I areas in the state.

7.5. Exemption of Point Source Volatile Organic Compounds for BART Purposes

The State of West Virginia determined through modeling that Volatile Organic Compounds (VOC) from point sources are not anticipated to cause or contribute significantly to any impairment of visibility and should be exempt for BART purposes.

7.5.a. Method

Modeling was conducted through VISTAS which contracted with Georgia Institute of Technology to perform model sensitivity runs to determine the impact of point source VOCs on visibility in Class I areas.

Georgia Tech performed emission sensitivities to examine the impact of emission reductions on regional haze, annual PM2.5, and 8-hour ozone concentrations using CMAQv4.4_SOAmods on the VISTAS 12 km modeling domain, using the 2009 OTW (on the way) BaseD emissions. One such sensitivity run reduced anthropogenic, point source VOCs by 100%. The purpose was to quantify the impact of VOC emissions from VISTAS BART sources on Class I areas. Two episodes were examined: June 1-July 10, 2002 and November 19 – December 19, 2002. The approach included calculating the extinction coefficient in dv (deciviews), then determining the maximum impact of point source VOCs. The chart below shows the impact on the twenty-two Class I areas within the VISTAS domain.

7.5.b. Conclusions

The results show that the maximum impact from eliminating all point source VOC emissions in the VISTAS 12 km domain is less than a 0.5 dv for all Class I areas in the VISTAS domain. Given that the fraction of the total point source VOC emissions that are also BART-eligible in the state of West Virginia is about 29%, the expected impact of controlling VOCs from a BART source would be much less than the 0.5 dv threshold. Indeed, the point source VOC contribution is only about 3% of total VOCs when biogenic sources are included. VISTAS and the State of West Virginia conclude that VOCs from point sources are not a visibility impairing pollutant for BART purposes and that BART-eligible sources do not need to consider VOC emissions.

7.6. Treatment of Ammonia Emissions for BART Purposes

Similar to its treatment of VOCs, EPA guidance allows States the discretion to decide whether or not ammonia emissions are to be considered for BART purposes based on evaluations of the contributions of the emissions to haze at Class I areas in their areas of influence. One approach a State can use to determine whether applying BART will be needed is to evaluate the haze impacts of all current emissions from all BART-eligible sources in the State. If the impact from all sources in the state is less than the contribution threshold established by the State, 0.5 dv for West Virginia, then source by source analysis for BART is not needed.

The State of West Virginia has determined through modeling that ammonia (NH_3) emissions from point sources are not anticipated to cause or contribute significantly to any impairment of visibility in Class I areas and should be exempt for BART purposes.

7.6.a. Method

VISTAS contracted with Georgia Institute of Technology to perform model sensitivity runs to determine the impact of point source ammonia on visibility in Class I areas.

Georgia Tech performed emission sensitivities to examine the impact of emission reductions on regional haze using CMAQv4.5 with Secondary Organic Aerosols (SOA) mods on the VISTAS 12 km modeling domain, using the VISTAS 2009 OTW (on the way) Base F4 emissions. One such sensitivity run reduced, BART-eligible source ammonia by 100%. The purpose was to quantify the impact of ammonia emissions from VISTAS BART sources on Class I areas. Two episodes were examined: June 1-July 10, 2002 and November 19 – December 19, 2002. The approach included calculating the extinction coefficient in dv (deciviews), then determining the maximum impact of BART-eligible source ammonia. The chart below, taken from the VISTAS report *BART in the VISTAS Region: Sensitivity to VOC, NH_3, and Primary PM Emissions*, included in Appendix L, shows the impact on the twenty-two Class I areas within the VISTAS domain.

7.6.b. Conclusions

The BART requirements of the regional haze rule allow states to determine whether or not ammonia is to be considered a visibility impairing pollutant to be addressed for BART purposes. NH_3 emissions from BART sources may impair visibility; however the majority of NH_3 emissions in the VISTAS region are from a few BART sources. Removal of the large NH_3 emission sources results in minimal impact on visibility at Class I areas in the VISTAS region. At their discretion states may ask those few large sources to evaluate NH_3 impacts and potential controls for NH_3. Based on the CMAQ sensitivity analyses of the impact of ammonia emissions, West Virginia concluded that NH_3 is not a visibility impairing pollutant for BART purposes and that BART-eligible sources do not need to consider NH_3 emissions.

8.0. Explanation of BART Exemption Modeling

8.1. Background

West Virginia opted to consider its BART-eligible sources subject to BART unless the source demonstrated exemption via modeling. BART-eligible sources can be excluded from BART determinations by demonstrating that the source cannot be reasonably expected to cause or contribute to visibility impairment in a Class I area. The threshold for determining that a source causes visibility impairment is set at 1.0 dv change from natural conditions over a 24 hour averaging period. The BART guidelines also propose that the threshold at which a source may "contribute" to visibility impairment should not be higher than 0.5 deciviews; however, depending on factors affecting a specific Class I area it may be set lower than 0.5 deciviews.

As stated in the BART regulation EPA's preferred approach for determining cause or contribution is an assessment with an air quality model such as CALPUFF or other appropriate model followed by comparison of the estimated 24-hour visibility impacts against a threshold above estimated natural conditions to be determined by the State. EPA recommends that the 98th percentile value from the modeling be compared to the State's chosen contribution threshold to determine if a source does not contribute to visibility impairment and thus is not subject to BART. Comparison of the 98th percentile value to the threshold must be made for each Class I area. For an annual period, this implies the 8th highest 24-hr value at a particular Class I area is compared to the contribution threshold. For a 3-year modeling period, the 98th percentile value may be interpreted as the highest of the three annual 98th percentile values at a particular Class I area or the 22nd highest value in the combined three year record, whichever is more conservative.

West Virginia worked with VISTAS on development of the VISTAS *Protocol for the Application of the CALPUFF Model for Analyses of Best Available Retrofit Technology (BART)* (Attachment H.4). The common protocol was established to provide the basis for a common understanding among the organizations performing BART analyses or reviewing BART modeling results in the VISTAS region.

The VISTAS protocol describes common procedures for carrying out air quality modeling to support BART determinations that are consistent with the 40 CFR Part 51 Appendix Y guidelines. The protocol provides a consistent model, CALPUFF, and modeling guidelines for BART determinations, clearly delineated modeling steps, a common CALPUFF configuration,

In the site-specific modeling demonstrations, the CALPUFF model incorporating three years of pre-processed MM5 meteorological data was used to evaluate the deciview change compared to natural background conditions at each of the Class I areas within 300 km of the source. The 4 km MM5 dataset prepared by VISTAS was used. The 98th percentile delta-deciview (dv) value was determined at each Class I area and compared to the 0.5 dv contribution threshold.

Twenty-one (21) of the twenty-two (22) facilities submitted site-specific data or modeling protocols and the modeling demonstrations were based upon the VISTAS modeling protocol. The site-specific information is included in Appendix L.

The individual facility modeling demonstrations were reviewed by WVDAQ Modeling staff and shared with both EPA and the FLMs for their review and comment. WVDAQ staff reviewed the demonstrations to determine whether the sources have less than 0.5 dv impact on any Class I area within 300 km of the source. Sources demonstrating less than 0.5 dv impact are considered exempt. Sources contributing 0.5 dv impact or greater are considered subject to BART and were required to proceed to an analysis of what control measures, if any, constitute BART for the source.

Table 8.2-1. BART Exemption Modeling Results
12 km Modeling - Maximum Predicted Visibility Impact (delta-deciview) per Class I Areas

Company	Year	Dolly Sods, WV	Otter Creek, WV	Shenan-doah, VA	James River Face, VA	Linville Gorge, NC	Great Smoky Mountains, TN
Mountain State Carbon (009-00002)							
	2001	0.057	0.059	0.091	n/a	n/a	n/a
	2002	0.055	0.051	0.061	n/a	n/a	n/a
	2003	0.048	0.051	0.065	n/a	n/a	n/a
Mittal Steel USA - Weirton, Inc.							
	2001	0.131	0.148	0.170	n/a	n/a	n/a
	2002	0.182	0.155	0.081	n/a	n/a	n/a
	2003	0.185	0.299	0.102	n/a	n/a	n/a
ERGON Corp. - West Virginia, Inc.							
	2001	0.031	0.022	0.055	n/a	n/a	n/a
	2002	0.032	0.036	0.026	n/a	n/a	n/a
	2003	0.035	0.054	0.020	n/a	n/a	n/a

Table 8.2-1. BART Exemption Modeling Results 12 km Modeling - Maximum Predicted Visibility Impact (delta-deciview) per Class I Areas							
Company	**Year**	**Dolly Sods, WV**	**Otter Creek, WV**	**Shenan-doah, VA**	**James River Face, VA**	**Linville Gorge, NC**	**Great Smoky Mountains, TN**
Kepler Processing (109-00013)							
	2001	0.018	0.013	0.039	0.029	0.023	0.029
	2002	0.012	0.010	0.021	0.029	0.026	0.013
	2003	0.024	0.031	0.032	0.056	0.022	0.032

Table 8.2-2. BART Exemption Modeling Results 4km Modeling - 98th Percentile Visibility Impact (delta-deciview) per Class I Area							
Company	**Year**	**Dolly Sods, WV**	**Otter Creek, WV**	**Shenan-doah, VA**	**James River Face, VA**	**Linville Gorge, NC**	**Great Smoky Mountains, TN**
AEP - Appalachian Power Co. - John Amos (079-00006)							
	2001	0.054	0.073	0.062	0.075	0.029	n/a
	2002	0.054	0.081	0.055	0.052	0.014	n/a
	2003	0.059	0.082	0.074	0.062	0.018	n/a
AEP - Ohio Power Co. - Mitchell (051-00005)							
	2001	0.094	0.097	0.076	0.031	n/a	n/a
	2002	0.045	0.058	0.053	0.022	n/a	n/a
	2003	0.076	0.077	0.066	0.029	n/a	n/a
AEP - Appalachian Power Co. - Mountaineer ((053-00009)							
	2001	0.259	0.344	0.253	0.164	n/a	n/a
	2002	0.172	0.266	0.281	0.142	n/a	n/a
	2003	0.201	0.250	0.217	0.142	n/a	n/a

Consistent with BART regulation requirements and EPA guidance, BART-eligible sources at electric utilities complying with EPA's Clean Air Interstate Rule (CAIR) that wished to demonstrate exemption were allowed to model only direct PM fine emissions. Compliance with CAIR constitutes BART for these sources for NOx and SO_2.

West Virginia submitted a CAIR SIP to the EPA in June 2006. The submittal was believed to be approvable at that time. EPA subsequently revised various aspects of the the CAIR program through other rule-makings, including promulgation of a Federal Implementation Plan (FIP). West Virginia then submitted an "abbreviated SIP" to be consistent with the FIP and related EPA guidance. West Virginia is subject to the CAIR FIP (as modified by the abbreviated SIP) until a full SIP is submitted and approved.

Review of the demonstrations submitted led to the determination that the BART-eligible source at each facility in Tables 8.2-1 and 8.2-2 should be exempt from BART determination requirements. The modeled impacts from the facilities in Table 8.2-1 ranged from 0.009 at Linville Gorge, NC to 0.299 at Otter Creek, WV, and the impacts from facilities in Table 8.2-2 ranged from 0.014 at Linville Gorge, NC to 0.441 at Otter Creek, WV. Based on these demonstrations, WVDAQ proposes to exempt these nineteen sources from further BART evaluation.

Two additional facilities conducted modeling in an effort to demonstrate a contribution less than 0.5 dv. One facility is a coal-fired power plant (Mt. Storm) and one is a chemical manufacturer with a coal-fired industrial boiler (PPG). These facilities were unable to demonstrate less than 0.5 dv of impact. One additional facility, Capitol Cement, a portland cement manufacturer did not conduct modeling, but chose to acknowledge that Kiln 9 is BART subject. Table 8.2-3 shows the impacts from these sources.

Table 8.2-3. Exemption Modeling Results for Facilities with >0.5 deciview of Impact 4km Modeling - 98th Percentile Visibility Impact (delta-deciview) per Class I Area

Company	Year	Dolly Sods, WV	Otter Creek, WV	Shenandoah, VA	James River Face, VA
Dominion - Mt. Storm (023-00003)					
	2001	0.770	0.205	0.538	0.124
	2002	0.636	0.286	0.381	0.097
	2003	0.416	0.297	0.401	0.098
PPG Industries ((051-00002)					
	2001	0.557	0.669	0.786	0.513
	2002	0.635	0.615	0.816	0.507
	2003	0.578	0.596	0.587	0.364

Technical Support Document for the Modeling Portions of the State of West Virginia's
Regional Haze State Implementation Plan (SIP)
Entitled "West Virginia Regional Haze
State Implementation Plan to Preserve, Protect and Improve
Visibility in Class I Federal Areas
Final
June 2008"

TSD Prepared February, 2011
Todd A. Ellsworth
Office of Air Monitoring and Analysis, 3AP40
U.S. Environmental Protection Agency, Region 3
1650 Arch Street
Philadelphia, Pennsylvania 19103

/s/
Reviewed by Walter Wilkie, Associate Director,
Office of Air Monitoring and Analysis (3AP40)

3/11/2011
Date Signed

represented the first phase in addressing visibility impairment. EPA deferred action on regional haze that emanates from a variety of sources until monitoring, modeling and scientific knowledge about the relationships between pollutants and visibility impairment were improved.

Congress added section 169B to the CAA in 1990 to address regional haze issues. EPA promulgated a rule to address regional haze on July 1, 1999 (see 64 FR 35713), the Regional Haze Rule (RHR). The RHR revised the existing visibility regulations to integrate into the regulation provisions addressing regional haze impairment and established a comprehensive visibility protection program for Class I areas. The requirements for regional haze, found at 40 CFR 51.308 and 51.309, are included in EPA's visibility protection regulations at 40 CFR 51.300-309.

The RHR addressed the combined visibility effects of various pollution sources over a wide geographic region. 40 CFR 51.308(b) requires states to submit the first implementation plan addressing regional haze visibility impairment no later than December 17, 2007. Consequently, all 50 states, including those without Class I areas, Washington, D.C., and the Virgin Islands, are required to submit Regional Haze SIPs[2]. The USEPA designated five Regional Planning Organizations (RPOs) to assist with the coordination and cooperation needed to address the visibility issue. West Virginia is among those states that make up the southeastern portion of the contiguous United States known as VISTAS (Visibility Improvement – State and Tribal Association of the Southeast), and includes the eastern band of the Cherokee Indians in addition to the following states: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia (See Figure 1). Studies show that West Virginia significantly contributes visibility impairment in the following Class I areas: Dolly Sods Wilderness Area, Otter Creek Wilderness Area, James River Face Wilderness Area, Linville Gorge Wilderness Area, and Shenandoah National Park. With the help of the Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) RPO, West Virginia has developed a SIP to address visibility impairment in all of these Class I Federal Areas. Figure 2 shows the 18 mandatory Federal Class I areas in the VISTAS Region.

[2]Albuquerque/Bernalillo County in New Mexico must also submit a regional haze SIP to completely satisfy the requirements of section 110(a)(2)(D) of the CAA for the entire State of New Mexico under the New Mexico Air Quality Control Act (section 74-2-4).

Introduction to West Virginia's Visibility State Implementation Plan

EPA promulgated a rule to address regional haze on July 1, 1999 (see 64 FR 35713), the RHR. The RHR addressed the combined visibility effects of various pollution sources over a wide geographic region. 40 CFR 51.308(b) requires states to submit the first implementation plan addressing regional haze visibility impairment no later than December 17, 2007.

This SIP was developed based on consultations and work-products of the VISTAS Regional Planning Organization (RPO). It encompasses 1) monitoring strategies for evaluating visibility impacts, 2) baselines and trends, 3) long-term strategies (LTS), 4) how West Virginia meets its fair share of the "reasonable progress goals" (RPG) towards reducing visibility impairment in Class I areas, and 5) Best Available Retrofit Technology (BART). VISTAS states agreed upon a ≥ 1 percent sulfate attribution to a Class I area in order for an upwind state to meet the definition of "significantly contributing" to visibility impairment for that Class I area. Studies show that West Virginia significantly contributes visibility impairment in the following Class I areas: Dolly Sods Wilderness Area, Otter Creek Wilderness Area, James River Face Wilderness Area, Linville Gorge Wilderness Area, and Shenandoah National Park. Therefore, this SIP focuses on how West Virginia's control measures will improve visibility in these areas.

The West Virginia Division of Air Quality (WVDAQ) believes their Haze SIP demonstrates that West Virginia has met its BART, RPG and LTS obligations for the first visibility impairment planning period through existing West Virginia/Federal regulations and on-the-books/on-the-way federal emission controls. In addition to extensive consultation with the VISTAS states, West Virginia has consulted with Federal Land Managers (FLMs) responsible for the Class I areas, and the EPA in the development of this SIP.

What Are The Components Of A Modeled Regional Haze Demonstration?

Modeling Process Overview

The goal of the regional haze program is to return to natural conditions by 2064, and States are required to demonstrate, by the end of the first planning period (by 2018), reasonable progress toward meeting that goal.

West Virginia is a member of the VISTAS RPO. The VISTAS RPO was tasked with the assignment of preparing a $PM_{2.5}$ modeling platform that all member states could use to model their LTSs to demonstrate reasonable progress by 2018 in meeting the ultimate goal of natural visibility conditions by 2064.

The regional haze modeling was coordinated by the Southeast Regional Planning Organization, Visibility Improvement State and Tribal Association of the Southeast (VISTAS), which is comprised of the ten Southeast States (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia) and the local programs and tribal agencies located within these states. VISTAS contracted with Environ International Corp, Alpine Geophysics, LLC and the University

Steps Required in Modeling Future Year Visibility Improvement

The modeling guidance lists nine steps for preparing modeling to demonstrate reasonable progress toward visibility improvement goals.

1. Develop a conceptual description of the problem to be addressed.
2. Select an appropriate model to support the demonstration.
3. Select appropriate meteorological time periods to model.
4. Choose an appropriate area to model with appropriate horizontal/vertical resolution and establish the initial and boundary conditions that are suitable for the application.
5. Generate meteorological inputs to the air quality model.
6. Generate emissions inputs to the air quality model.
7. Run the air quality model with base case emissions and evaluate the performance. Perform diagnostic tests to improve the model, as necessary.
8. Perform future year modeling (including additional control strategies, if necessary) and use the results to calculate future year visibility and visibility improvement.

How Did West Virginia Address All Of The Components a Modeled Demonstration Of Future Year Visibility Improvement?

The West Virginia Haze SIP addresses each of the required elements of a modeling analysis used to predict visibility improvement that is expected by 2018.

Conceptual Description of the Problem

A conceptual model describes how weather patterns affect the formation and transport of $PM_{2.5}$, accounting for emissions and photochemistry.

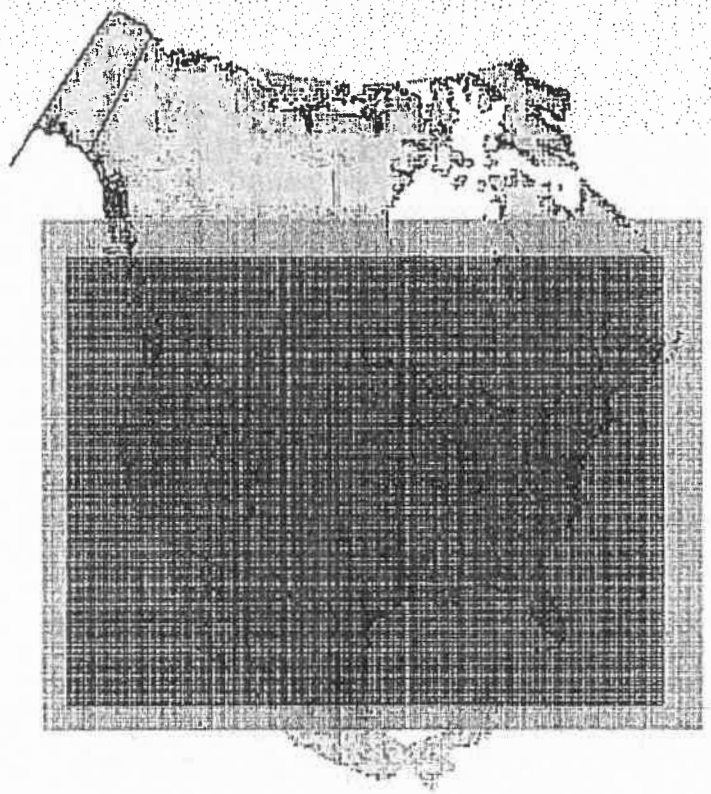
The conceptual model for the West Virginia $PM_{2.5}$ SIP is described in Appendix B of the WV Haze SIP. Air Resources Specialists, Inc (ARS) was contracted by VISTAS to develop a conceptual description of the current visibility in the VISTAS area as it relates to meteorology and source distribution. This document was prepared in accordance with EPA guidance.

Ammonium sulfate is the largest contributor to visibility impairment on the 20% haziest days in the baseline 2000-2004 period (69-74%) at all the IMPROVE sites in the VISTAS region except Everglades National Park in Florida, where Ammonium sulfate is a close second to Particulate Organic Material (POM) (40 and 45%, respectively). Particulate Organic Material (also referred to as organic carbon) is the second largest contributor to aerosol extinction at all other sites, contributing to between 13 and 18% of aerosol extinction on the worst days. Baseline conditions for 20% worst days at the inland sites (182.2 - 241.4 Mm-1) average higher WV Regional Haze SIP Appendix B.1 – 494 3- 18 than conditions measured at the coastal sites (116.4 - 147.3 Mm-1). Ammonium sulfate is also the largest contributor to visibility impairment on the 20% best days (45-59%), with large contributions from ammonium nitrate (9-21%) POM (11-19%). Sea salt is not a factor on the 20% worst days, but for the 20% best days it contributes to between 2 and 7% of the aerosol extinction at the VISTAS coastal sites. Ammonium sulfate, Coarse Mass(CM) and POM are the largest contributors to total mass on the 20% best and worst days. CM, although it is a factor for total mass, has a low extinction efficiency and does not contribute significantly to aerosol extinction.

Domain of the Model, Horizontal/Vertical Resolution and the Initial and Boundary Conditions

VISTAS has adopted the Inter-RPO domain description for its modeling runs. This 36-km domain covers the continental United States, southern Canada and northern Mexico. The dimensions of this domain are 145 and 102 cells in the east-west and north-south directions, respectively (see Figure 3). To achieve finer spatial resolution in the VISTAS states, a one-way nested high resolution (12-km grid resolution) was used. Figure 4 shows the 12-km grid, modeling domain for the VISTAS region. This is the modeling domain for which the reasonable progress goals are assessed.

Figure 3. The MM5 horizontal domain is the outer most, blue grid, with the CMAQ 36-km domain nested in the MM5



the regional haze modeling. The 2002 emissions from non-VISTAS areas within the modeling domain were obtained from other Regional Planning Organizations for their corresponding areas. These Regional Planning Organizations included the Mid-Atlantic/Northeast Visibility Union, the Midwest Regional Planning Organization and the Central Regional Air Planning Association.

The complete inventory and discussion of the methodology is contained in Appendix D of the West Virginia Haze SIP.

Model Performance Evaluation

VISTAS CMAQ modeling was conducted for year 2002 CMAQ Performance for PM 2.5 species and visibility was examined based on this CMAQ run on a 12 km resolution domain. Measurements from IMPROVE and STN networks were paired with model predictions by location and time for evaluation. The goal and the criteria for $PM_{2.5}$ evaluation suggested by Boylan and Baker (2004) were adopted by every RPO for SIP modeling. The performance goals are: Mean Fractional Error (MFE) $\leq +50\%$, and Mean Fraction Bias (MFB) $\leq \pm 30\%$; while the criteria are proposed as: MFE $\leq +75\%$, and MFB $\leq \pm 60\%$. CMAQ prediction of $PM_{2.5}$ species from STN sites and IMPROVE sites within the VISTAS Region were paired with measurements and statistically analyzed to generate MFE and MFB values. Considering CMAQ performance in terms of MFE and MFB goals, sulfate, nitrate, OC, EC, and $PM_{2.5}$ all had the majority of data points within the goal curve, some were between the goal and acceptable criteria, and only a few were outside the criteria curve. Only fine soil has the majority of points outside the criteria curve, but there were some sites still within the goal. For the VISTAS region, CMAQ performs best for $PM_{2.5}$ sulfate, followed by $PM_{2.5}$, EC, nitrate, OC, and then fine soil. Regional haze modeling also requires CMAQ performance evaluation for aerosol extinction coefficient (B_{ext}) and the haze index. Modeled daily aerosol extinction at each improve site was calculated following the IMPROVE formula with modeled daily $PM_{2.5}$ species concentration and relative humidity factors from IMPROVE. The approach used natural background visibility estimates and the haze index following EPA Guidance. The modeled B_{ext} showed a near 1:1 linear relationship with IMPROVE observed B_{ext}.

Overall, WVDAQ found model performance to fall within acceptable limits. The WVDAQ further asserts that the one atmosphere modeling performed by the VISTAS contractors is representative of conditions in the southeastern states and is applicable for use in setting reasonable progress goals for the Class I areas.

Uniform Rate of Progress Goals

The key difference between SIPs from States with Class I areas and those States without Class I areas, but may have sources that impact visibility on Class I areas, is the calculation of the baseline and natural visibility for their Class I areas and the determination of uniform rate of progress goals - expressed in deciviews - that provide for reasonable progress towards achieving natural visibility by 2064. It is the Class I states responsibility assess these calculations. The Class I States must also consult with those States, which may reasonably be anticipated to cause or contribute to visibility impairment in their Class I areas (40 CFR 51.308 (d)(1)(i-vi)).

The modeling results presented in Appendix M of the West Virginia Haze SIP show all VISTAS sites are projected to meet or exceed the uniform rate of progress goals for 2018 on the 20 percent worst days. In addition, no site anticipates increases in visibility impairment relative to the baseline on the 20 percent best days.

Summary of Photochemical Grid Modeling Results
In summary, the photochemical grid modeling, presented in the West Virginia Haze SIP, follow EPA's modeling guidance and is acceptable to EPA. All VISTAS Class I sites are projected to meet or exceed the uniform rate of progress goal for 2018 on the 20 percent worst days. In addition, no site anticipates increases in visibility impairment relative to the baseline on the 20 percent best days.

Contribution Assessment

The 1999 Regional Haze Rule requires States and Tribes to submit State Implementation Plans (SIPs) to the U.S. Environmental Protection Agency (USEPA) for approval by January 2008 at the latest. The haze SIPs must include a "contribution assessment" to identify those states or regions that may be influencing specially protected federal lands known as Federal Class I areas. These states or regions would then be subject to the consultation provisions of the Haze Rule. The Haze Rule also requires a "pollution apportionment" analysis as part of the long-term emissions management strategy for each site.

As described in the Conceptual Description portion of this TSD, sulfate alone accounts for anywhere from one-half to two-thirds of total fine particle mass on the 20 percent haziest days at VISTAS Class I sites. As a result of the dominant role of sulfate in the formation of regional haze in the VISTAS area, VISTAS concluded that an effective emissions management approach would rely heavily on broad-based regional SO2 control efforts in the eastern United States.

Area of Influence for VISTAS Class I Areas
There are 20 Class I areas located in the VISTAS area. The objective of the VISTAS Area of Influence analysis is to identify the geographic source regions that are contributing to visibility impairment at the Class I areas on the worst 20 percent visibility days. This information is being used by the VISTAS states as part of the evaluation and demonstration of reasonable progress toward visibility improvement in Class I areas. In order to identify states whose emissions are most likely to influence visibility in VISTAS Class I areas, VISTAS prepared a report entitled "VISTAS Area of Influence Analyses" located in Appendix M of the West Virginia Haze SIP.
Based on that work, VISTAS concluded that it was appropriate to define an "Area of Influence" (AOI) including all of the states participating in VISTAS plus other states outside VISTAS for which analyses indicated they contributed at least one percent (1%) of the sulfate ion in VISTAS Class I areas in 2002.

Contribution Assessment Results

4 The Class I designation applies to national parks exceeding 6,000 acres, wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks that were in existence prior to 1977.

3) Pollution control equipment in use at the source,
4) The remaining useful life of the source, and
5) The degree of improvement in visibility which may reasonably be anticipated to result from use of the technology.

Under the BART Guidelines, WVDAQ may consider exempting some sources from BART if it is found that they do not cause or contribute to visibility impairment in a Class I area. In accordance with the BART guidelines, WVDAQ chose to perform source-specific analyses to determine which sources cause or contribute to visibility impairment using the California Puff Model (CALPUFF). The CALPUFF modeling protocol used for determining which facilities are subject to BART is included in Appendix H of the WV Haze SIP. In accordance with the Guidelines, a contribution threshold of less than 0.5 deciviews was employed for determining which sources were exempt from BART.

CALPUFF is a multi-layer, multi-species, non-steady state puff dispersion model which can simulate the time and space varying meteorological conditions on pollutant transport, transformation and removal. CALPUFF uses three dimensional meteorological fields developed by the meteorological processing program CALMET.

CALPUFF contain algorithms for near source effects such as building downwash, traditional plume rise, partial plume penetration, sub-grid scale terrain interactions, as well as long range effects such as pollutant removal (dry and wet deposition), chemical transformation, vertical wind shear, over-water transport, and coastal interaction effects.

The CALPUFF modeling performed for all of West Virginia's BART sources conforms to EPA modeling guidance. A detailed description of the CALPUFF modeling can be found in Appendix H of the West Virginia Haze SIP.

West Virginia Sources Subject to BART

Twenty-one (21) of West Virginia's twenty-two (22) BART-eligible sources submitted exemption modeling demonstrations. Nineteen (19) of the twenty-one (21) sources were able to demonstrate exemption. Additional details are available in Appendix H. Capitol Cement (003-00006) was the only BART-eligible source which chose not to submit exemption modeling.

Although PPG Industries initially modeled a visibility impact greater than 0.5 deciviews on multiple Class I areas, PPG elected to accept a permit limit on its BART eligible unit which reduces its visibility impact to below the exemption threshold of 0.5 deciviews of impact at any Class I area. Permit, R14-027B, requires 4690.56 tpy of SO_2 emission reductions from Boiler #5 by May 1, 2008. Therefore, PPG is considered BART exempt.

Only Dominion's Mt. Storm Power Station in Mt. Storm was unable to demonstrate a contribution of less than 0.5 deciview at all Class I area within 300 km from their BART eligible sources. Therefore, Mt. Storm was the only source considered to be "subject to BART" and required to submit a permit application, containing their evaluation of potential BART options and a proposed BART determination. Mt. Storm submitted a

EXHIBIT H

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#COUNTRY=US
#YEAR=2011
#
Ptegu inventory for 2011en
Starting point is 2011el_flatnoncems inventory: 2011NEIv2_POINT_ptegu_2011ei_08mar2017_v10.csv
FIPS and lat/lon coordinate updates based on 2023en ptegu inventory from CAMD implemented by James Beidler (CSRA):
/work/EMIS/users/bte/WO146.4_naaqstrans/egu/2011en/
Other updates for 2011en based on state comments will be made with EMF revisions.
#
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#EXPORT_VERSION_NAME=2011en updates
#EXPORT_VERSION_NUMBER=1

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US	54051	6902311	71766013	NOX	1002	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	PM-CON	269.6	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	PM10-FIL	477.1	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	PM10-PRI	746.7	MITCHELL PLANT	1000	33.75
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US	54051	6902311	71766013	PM25-PRI	481	MITCHELL PLANT	1000	33.75
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US	54051	6902311	71766013	PM10-FIL	0.001466	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	PM10-PRI	0.409	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	PM25-FIL	0.000369	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	PM25-PRI	0.408	MITCHELL PLANT	1000	33.75
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#FF10
#COUNTRY US
#YEAR 2023

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US	54051	6902311	71766113	PM10-PRI	192.4575671	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766113	PM25-FIL	86.87389976	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766113	PM25-PRI	207.1144808	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766113	SO2	730.317	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766113	VOC	20.33135683	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	CO	154.7958936	MITCHELL PLANT	1000	33.75
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US	54051	6902311	71766013	PM10-PRI	266.3503878	MITCHELL PLANT	1000	33.75
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US	54051	6902311	71766013	SO2	700.972	MITCHELL PLANT	1000	33.75
US	54051	6902311	71766013	VOC	18.57226114	MITCHELL PLANT	1000	33.75

AEP Kentucky Power Company Mitchell Plant
1 Hour SO_2 Modeling Analysis Report
Cresap, WV

Prepared for
Kentucky Power Company
and
Wheeling Power Company

For Submittal
to
The West Virginia Department of Environmental Protection
Division of Air Quality

Prepared by
David J. Long, PE
Air Quality Services Section
American Electric Power Service Corporation

December 9, 2016

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INTRODUCTION

American Electric Power Service Corporation (AEPSC) on behalf of the American Electric Power subsidiary companies Kentucky Power Company and Wheeling Power Company that jointly own the Mitchell Plant located at Cresap, West Virginia was requested to perform air quality modeling relating to the impacts from Sulfur Dioxide (SO_2) emissions at the Mitchell Plant. This work was performed as part of the development of a Nonattainment SIP for the 1-hour SO_2 Standard in the Marshall County, West Virginia area by the West Virginia Department of Environmental Protection (WVDEP).

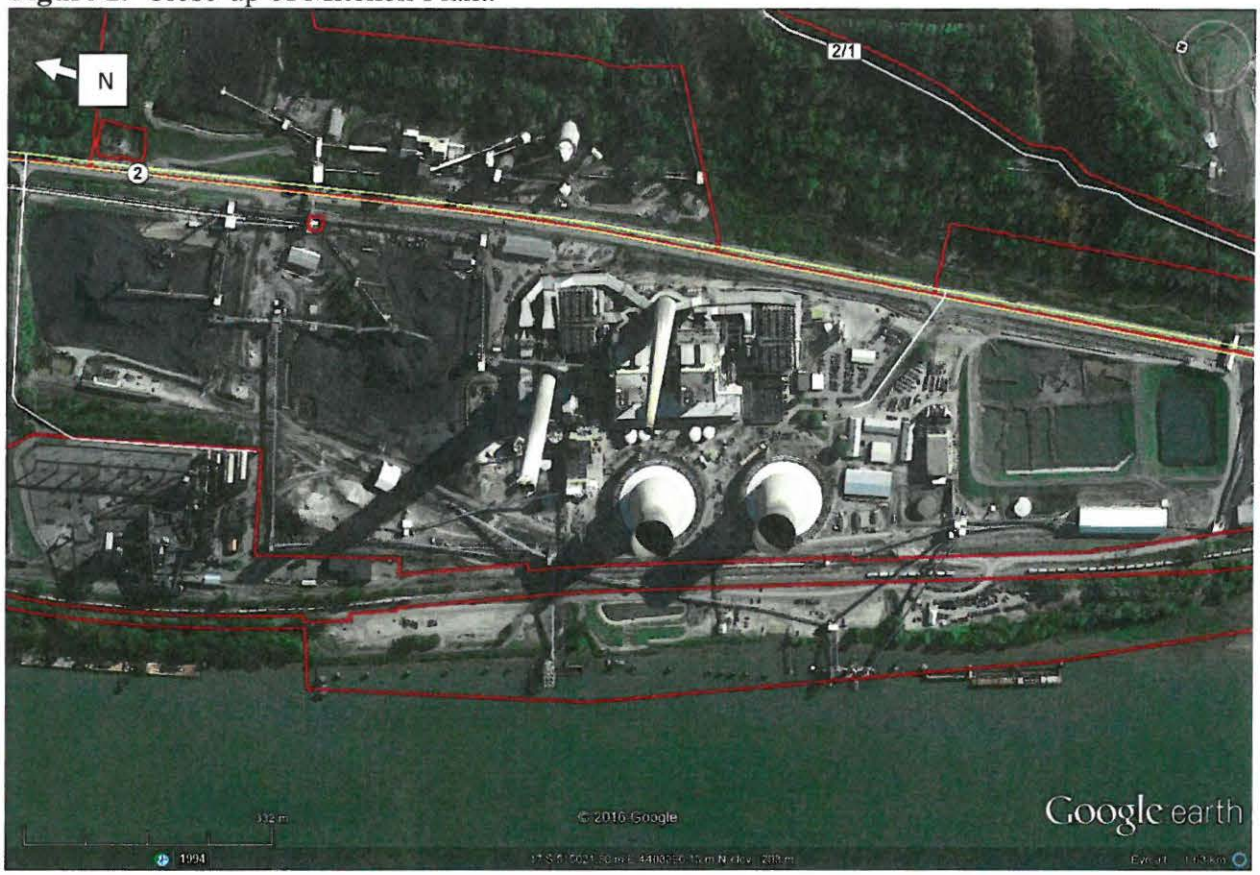
DESCRIPTION OF FACILITY AND AREA

The Mitchell Plant consists of two electric generating units rated at 800 MW net each, equipped with an electrostatic precipitator for particulate control, selective catalytic reduction (SCR) for nitrogen oxide and mercury control, and a limestone based flue gas desulfurization system. The plant is located in the Ohio River Valley in Marshall County, West Virginia, approximately 11 kilometers southwest of Moundsville, West Virginia. The elevation of the plant site is 203 m MSL with a valley that is typically between 1.0 and 1.5 kilometers wide in the vicinity of the plant site. The ridges that define the valley typically rise 120 to 160 meters above the valley floor in the vicinity of the plant. Figure 1 shows the nearfield view of the plant and terrain while Figure 2 shows a close-up of the plant.

Figure 1. Mitchell Plant and nearby terrain.

1

Figure 2. Close-up of Mitchell Plant.



The original 1204 foot stack was replaced by the current 1000 foot stack (304.80 meters) constructed as part of the FGD project that was placed in service in 2007 with the entire height being considered fully creditable for modeling based on a 2004 opinion issued by USEPA Region III in conjunction with the permitting of the FGD Systems on Units 1 and 2. This opinion was discussed in detail in the modeling protocol for this project.

FACILITY AND SOURCES MODELED

Based on discussions with WVDEP, the only facility to be considered in this study is the Mitchell Plant as it is the only significant source of SO_2 impacting Marshall County remaining in operation at the time of this study. In the protocol, this discussion was further documented along with the emissions for all of the combustion sources at the Mitchell Plant. Based on this multi-year documentation, the only sources examined were the coal fired main steam generators on the two generating units.

The emissions from the generating units were examined in both a Base Case condition based on the FGD Permit 1.20 lb/MMBtu emission limit and a Control Case that was ultimately based on an emission rate of 0.60 lb/MMBtu. Operating conditions were based on the full load 90th

percentile values of temperature and exit gas flow rates measured by the Part 75 CEMS Systems for the period 2012 to 2014. The exit gas flow rates were then reduced to 75% and 50% of the full load value for the reduced load cases and the temperatures were dropped 1°K per load range to represent the minor differences in temperature observed across the load range. Tables 1 and 2 show the Base Case and Control Case operational inputs for Units 1 and 2.

Table 1. Modeling Inputs for the Base Case Mitchell Plant simulation.

Unit - Case	Flue Easting (m)	Flue Northing (m)	Stack Base (m)	Emission Rate (g/sec)	Stack Height (m)	Exit Temp (K)	Exit Velocity (m/sec)	Exit Diameter (m)
Unit 1 - Full	515679	4409009	203	1298.8	304.8	327.15	13.17	10.29
Unit 2 - Full	515675	4409021	203	1282.3	304.8	327.21	13.12	10.29
Unit 1 – 75%	515679	4409009	203	974.1	304.8	326.15	9.87	10.29
Unit 2 – 75%	515675	4409021	203	961.7	304.8	326.21	9.84	10.29
Unit 1 – 50%	515679	4409009	203	649.4	304.8	325.15	6.59	10.29
Unit 2 – 50%	515675	4409021	203	641.2	304.8	325.21	6.56	10.29

Table 2. Modeling Inputs for the Control Case Mitchell Plant simulation.

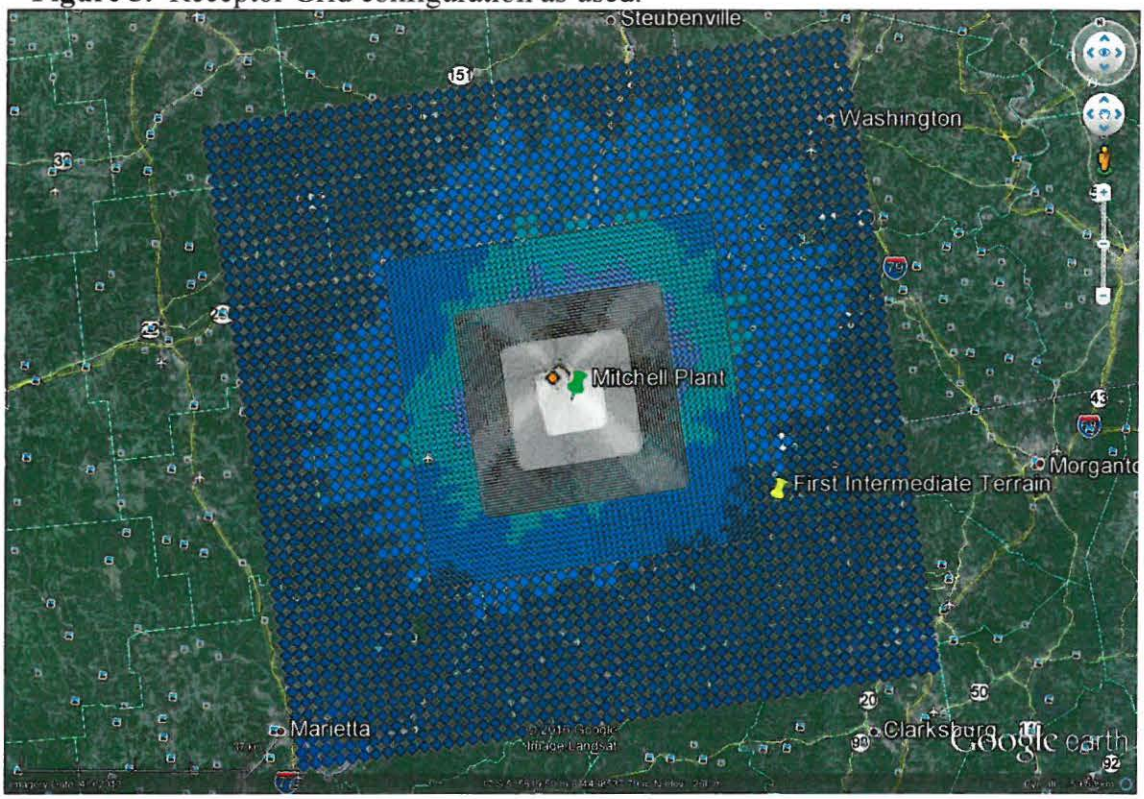
Unit - Case	Flue Easting (m)	Flue Northing (m)	Stack Base (m)	Emission Rate (g/sec)	Stack Height (m)	Exit Temp (K)	Exit Velocity (m/sec)	Exit Diameter (m)
Unit 1 - Full	515679	4409009	203	649.40	304.8	327.15	13.17	10.29
Unit 2 - Full	515675	4409021	203	641.15	304.8	327.21	13.12	10.29
Unit 1 – 75%	515679	4409009	203	487.05	304.8	326.15	9.87	10.29
Unit 2 – 75%	515675	4409021	203	480.85	304.8	326.21	9.84	10.29
Unit 1 – 50%	515679	4409009	203	324.85	304.8	325.15	6.59	10.29
Unit 2 – 50%	515675	4409021	203	320.60	304.8	325.21	6.56	10.29

MODEL PLATFORM USED

As detailed in the Modeling Protocol, AERMOD Version 15181 was used for the simulations presented in this report. No Beta Options were utilized. In support of the AERMOD simulations, Version 11103 of AERMAP was used to develop the nested modeling grid shown in Figure 3. No additional receptors were added to or removed from the grid as described in the Modeling Protocol. Version 04274 of BPIPPRM was used to determine the building and structure height impacts on the stack for input into AERMOD.

The meteorologic inputs used were developed for the period 2011 through 2015 using Version 15181 of AERMET using Wheeling Airport surface data along with 1 and 5 minute data from the ASOS located at the site. Upper Air Data was sourced from the Greater Pittsburgh International Airport site through the National Oceanic and Atmospheric Administration Earth System Research Laboratory Radiosonde Database. The AERMET processing was supported via the use of AERSURFACE Version 13016 to determine the Albedo, Bowen Ratio, and Surface Roughness on a monthly basis for the five year period and AERMINUTE Version 15272 for processing the 1 and 5 minute ASOS data.

Figure 3. Receptor Grid configuration as used.



The input and output files used in the development of the modeling platform can be found on the DVD's in the Appendix.

BACKGROUND VALUE

The background value developed by Ohio EPA[1] as part of the Jefferson County, Ohio and Brooke County, WV nonattainment study was used for this study as described in the Modeling Protocol. More details on the development of this background value of 8.1 ppb (21.2 $\mu g/m^3$) can be found in the Modeling Protocol for this project and the Ohio EPA documentation previously referenced.

RESULTS

When the base case was run using the currently permitted emission rate of 1.2 lb/MMBtu, the modeled design value exceeded the 1-Hour SO_2 ambient standard of 196.6 $\mu g/m^3$ by a significant amount. This indicated that the permitted limit would need to be reduced to bring the area into modeled attainment with the 1-Hour SO_2 Standard. In order to determine what this new permitted limit needed to be, it was necessary to adjust the modeled value to remove the impacts of background in order to determine the emission rate necessary to model attainment. It was also determined that the limiting case was the full load case.

When the background value of 21.2 $\mu g/m^3$ was removed from both the modeled base case value and the ambient standard the resulting emission rate adjustment ratio of 0.50 was determined and applied to the current emission limit of 1.2 lb/MMBtu resulting in a projected emission rate of 0.60 lb/MMBtu needed to model attainment with the 1-Hour SO_2 Standard at all receptors in the domain. When the projected control emission rate of 0.60 lb/MMBtu was modeled as shown in Tables 2 and 3, it demonstrated modeled attainment when background was added. The design value results for the entire modeling domain for both the base case and control case simulations for all load ranges are shown in Table 4.

Table 3. Modeled Control Case Emission Rates at 0.60 lb/MMBtu in lb/hr and g/sec.

	Full Load			75% Load			50% Load		
	Heat Input (MMBtu)	**lb/hr**	**g/sec**	**Heat Input (MMBtu)**	**lb/hr**	**g/sec**	**Heat Input (MMBtu)**	**lb/hr**	**g/sec**
Unit 1	8590	5154.1	649.40	6442.6	3865.6	487.05	4297.1	2578.2	324.85
Unit 2	8481	5088.6	641.15	6360.6	3816.3	480.85	4240.8	2544.5	320.60
Plant Total	17071	10242.7	1290.55	12803.2	7681.9	967.90	8537.9	5122.7	645.45

Table 4. Consolidated Design Value results for the Base and Control Cases with Background

Case/Load	Full Load		75% Load		50% Load	
	$\mu g/m^3$	Location	$\mu g/m^3$	Location	$\mu g/m^3$	Location
Base Case	369.49	518775.5 E 4410220.0 N	317.74	518375.5 E 4410020.0 N	249.95	518375.5 E 4410020.0 N
Control Case	195.34	518775.5 E 4410220.0 N	169.47	518375.5 E 4410020.0 N	135.57	518375.5 E 4410020.0 N

In examining the results of the Base Case and Control Case simulations shown in Table 4, it is noted that the 75% Load and 50% Load subcases have design values that are located at the same receptor, approximately 447 meters from the location of the Design Value Receptor for the Full Load subcase with both essentially on a direct line back toward the Mitchell Stack. The Full Load design value is roughly 3.3 kilometers from the Mitchell Stack on a heading of 69 degrees as shown in Figure 4. The two receptors where the Full Load and 75% and 50% Load Design Values are resident are on the top of the first ridge near the rear of the ridge. Both receptors are located on property that is not owned or controlled by Kentucky Power, Wheeling Power, or any related entity.

Plots showing the details of the Control Case modeling for both the 100 meter grid that contains the Design Value receptors and the overall 50 kilometer grid used for the entire study are shown by load subcase in Figures 5 through 11.

Figure 4. Location of Design Value receptors and heading.

Figure 5. Receptor plot of the Full Load Subcase 100 meter grid.

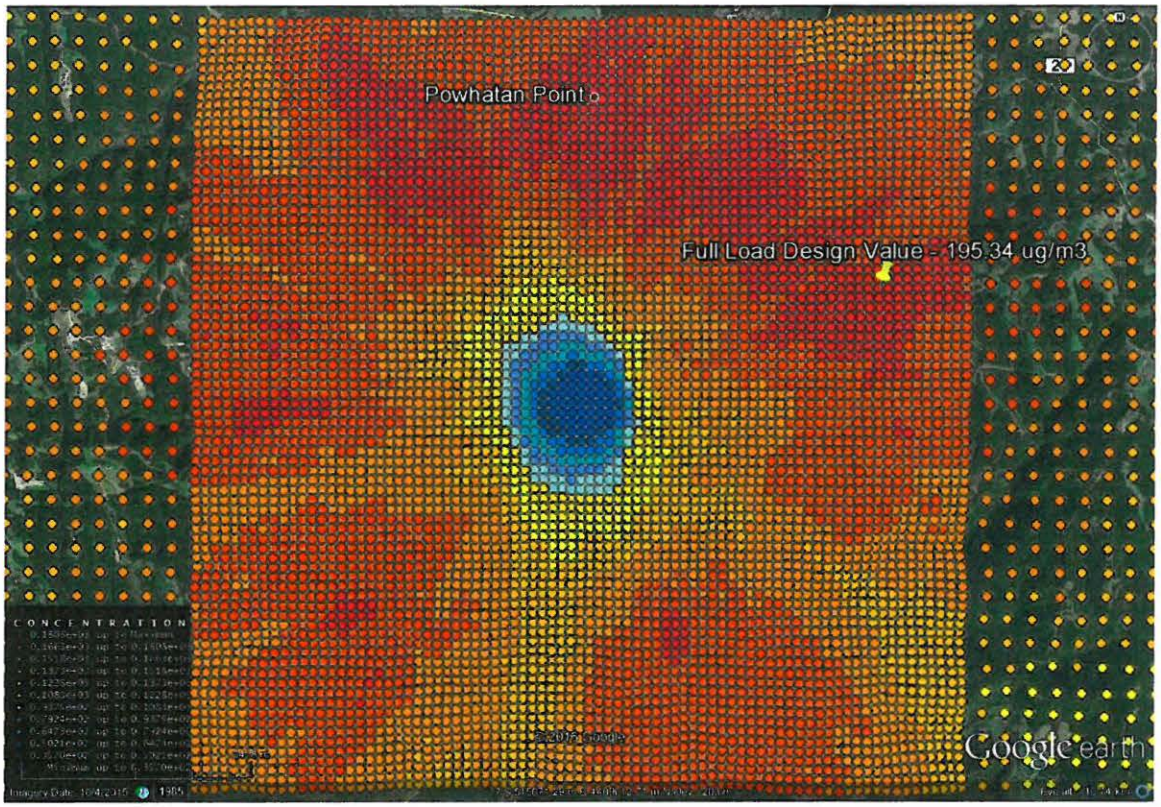


Figure 6. Contour Plot detail of the 100 μg/m^3 and higher contours at full load.

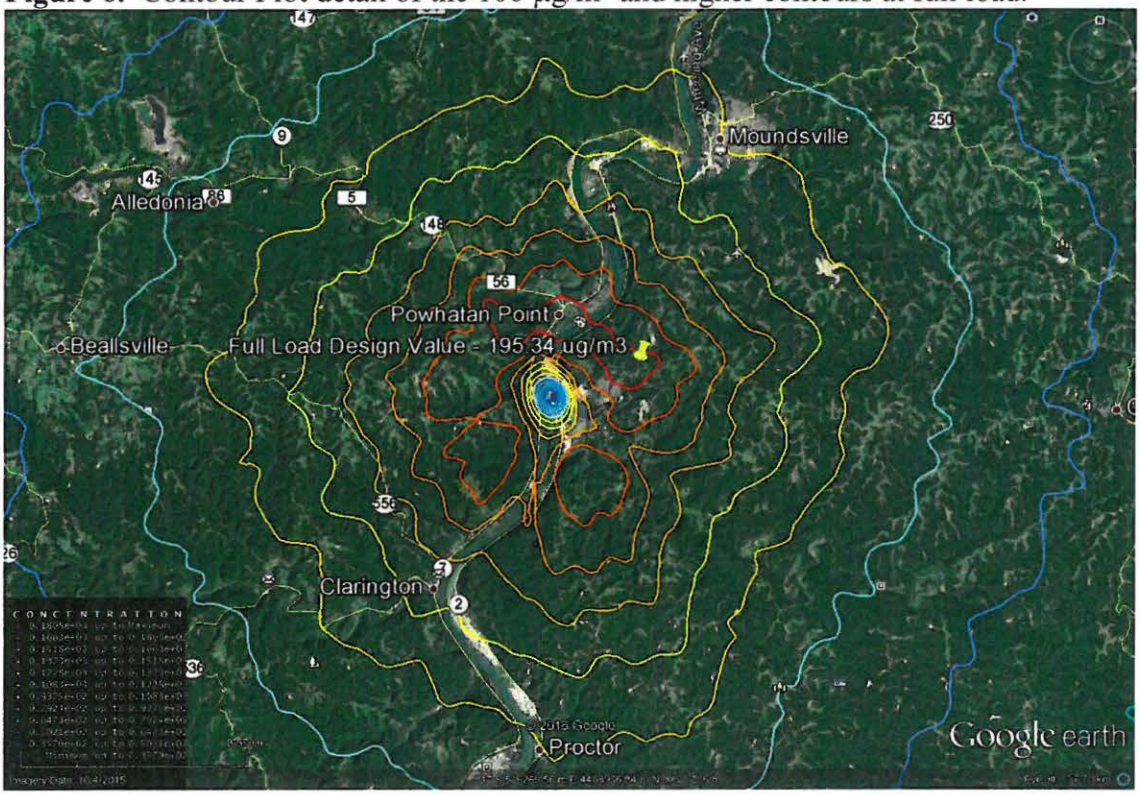


Figure 7. Contour plot of the Full Load Subcase modeling domain.

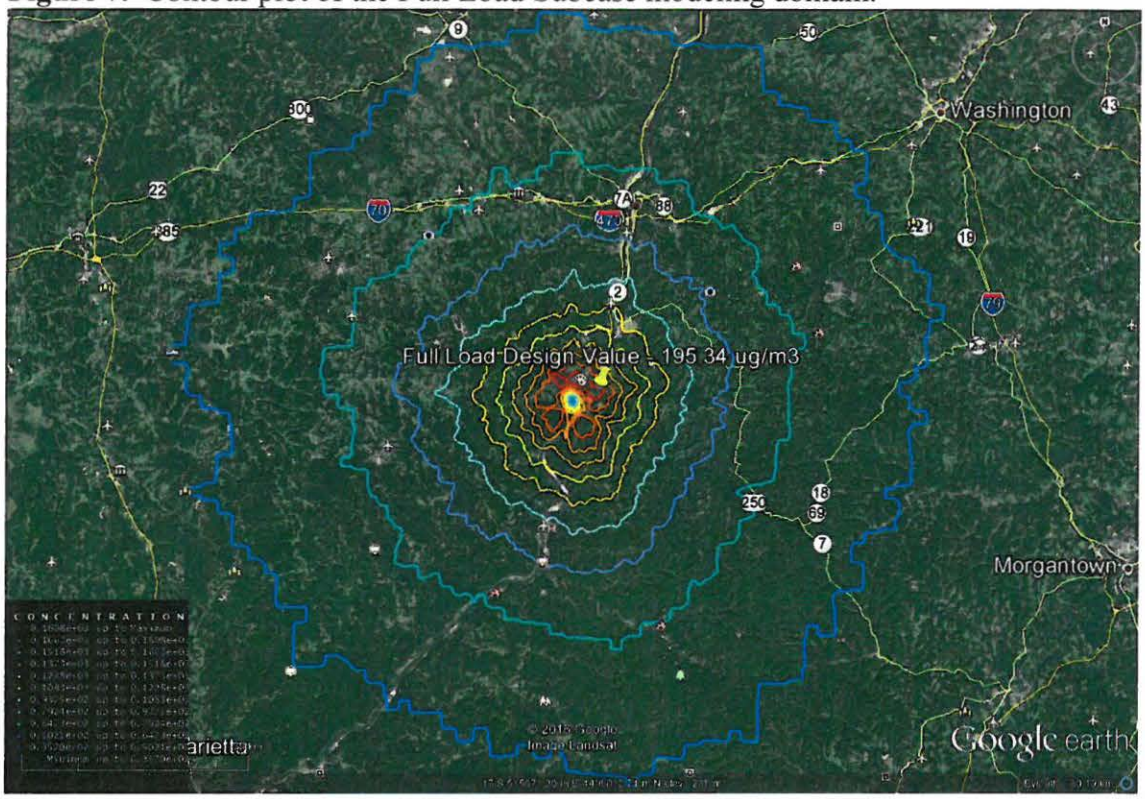


Figure 8. Receptor plot of the 75% Load Subcase 100 meter grid.

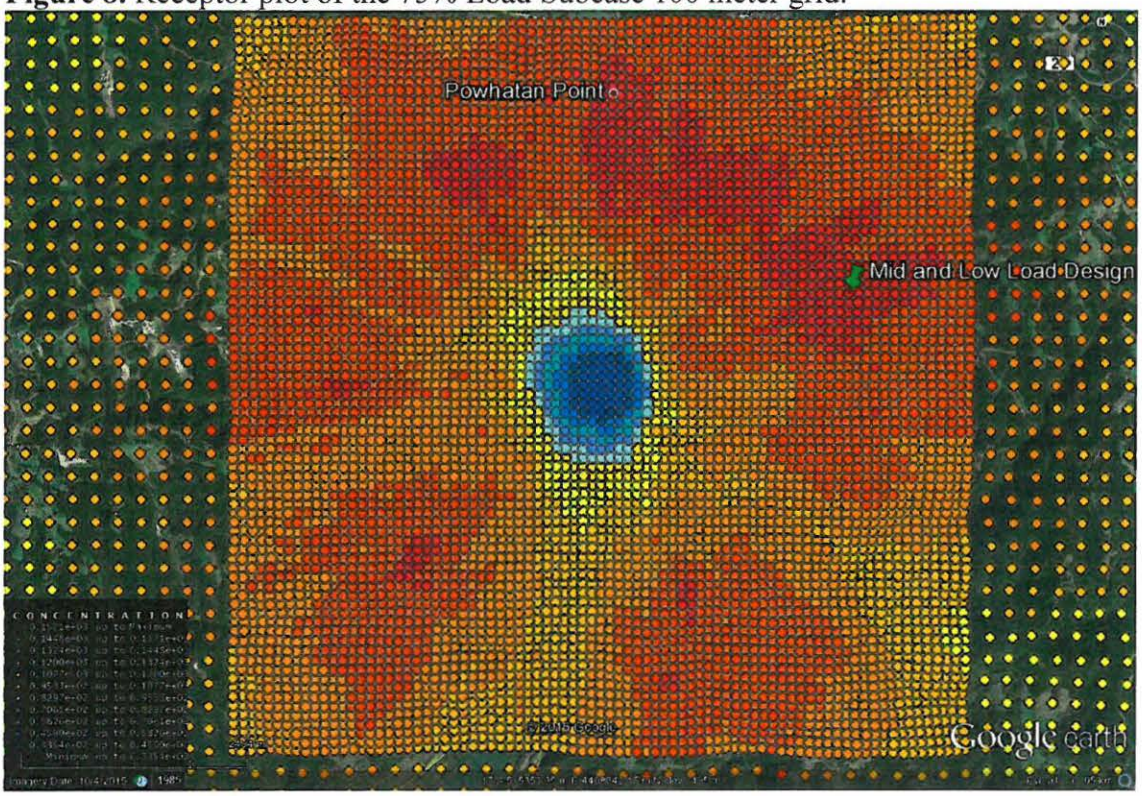


Figure 9. Contour plot of the 75% Load Subcase modeling domain.

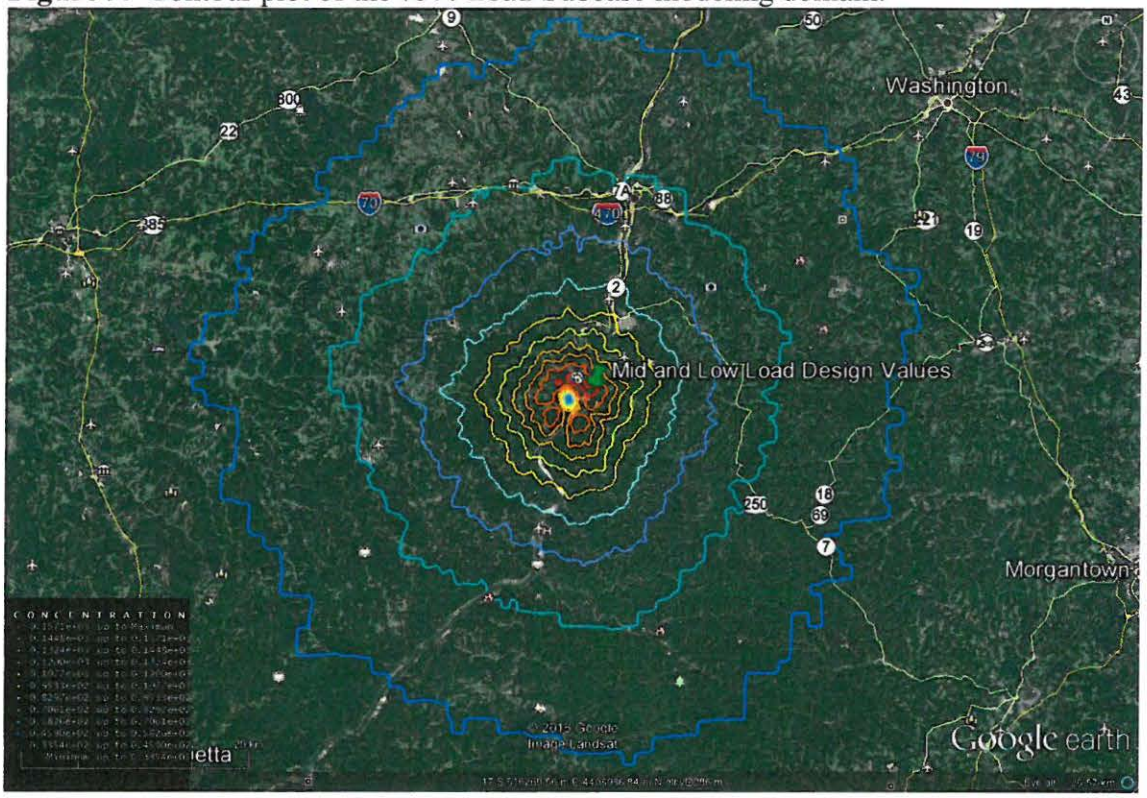


Figure 10. Receptor plot of the 50% Load Subcase 100 meter grid.

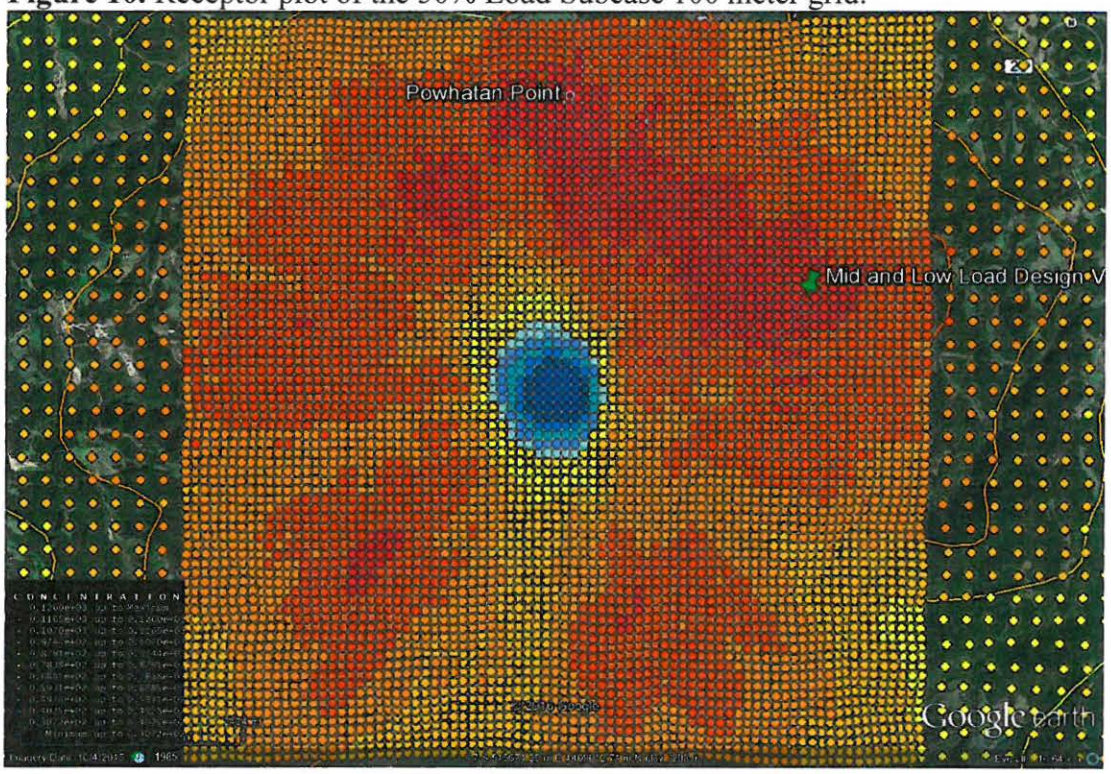
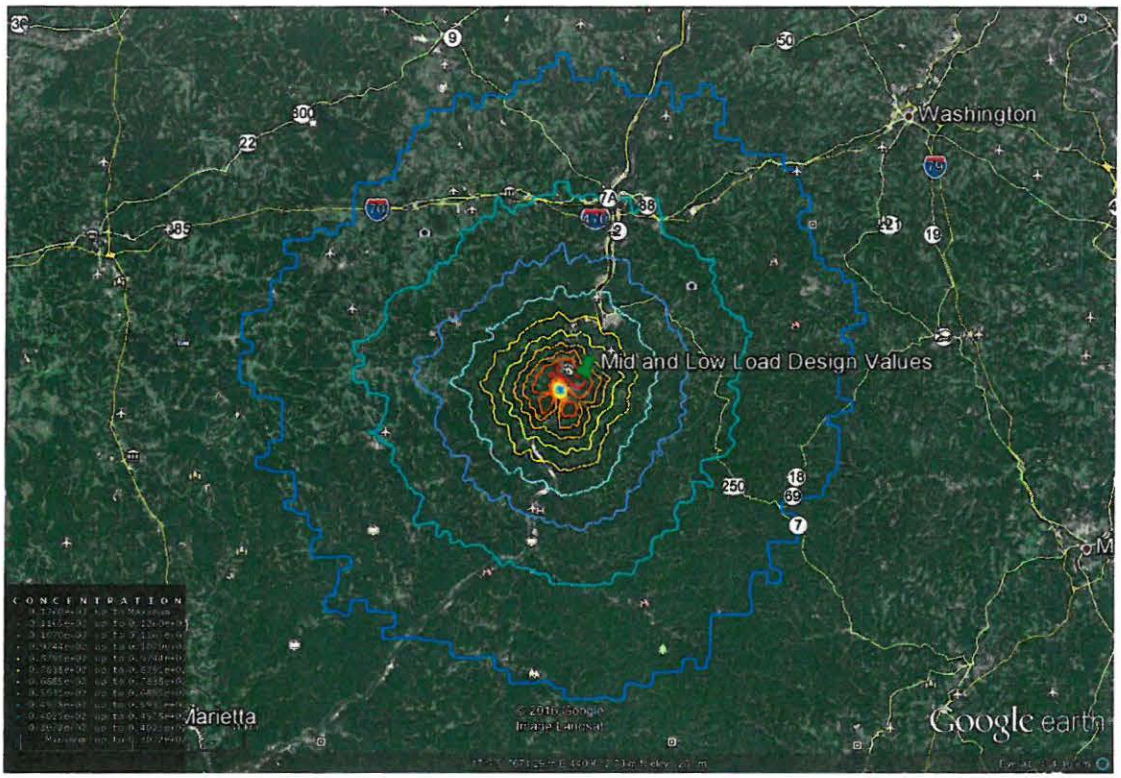


Figure 11. Contour plot of the 50% Load Subcase modeling domain.



CONCLUSIONS

Based on this modeling study, the appropriate modeled solution to achieve attainment with the 1-Hour SO_2 Standard on a one hour basis is an emission limit based on 0.60 lb/MMBtu at the heat inputs of 8590 and 8481 MMBtu per unit for Units 1 and 2 at Mitchell Plant respectively or a plant total of 10242.7 lb/hr of SO_2. A plant total emission limit is appropriate in this case since the two discharges are within just a few meters of each other in a single shell stack.

While a plant total emission limit is appropriate for Mitchell, the use of a one hour limit is not appropriate without allowances being made to remove the impact of artifacts generated by the use of 40 CFR Part 75 monitoring techniques. These artifacts include data substitutions that increase the consumption of allowances under various other USEPA programs and diluent capping in an effort to put more accuracy into the calculated emissions under very low load operations where monitored diluent values are very low. These conditions can result in reported hourly emissions under Part 75 that serve to increase the consumption of allowances, but do not result in accurate actual hourly emissions for use in determining compliance with an ambient standard program or for use in air quality modeling analyses.

Based on the known issues with Part 75 data, it is recommended that any emission limit imposed as a result of this study allow the use of unbiased, unsubstituted CEMS data, which would make most of the data impacted by the Part 75 artifacts show up as missing or erroneous resulting in their not being used in the determination. It is also recommended that a longer term average than one hour be used for the compliance determination to reduce the probability that an artifact in the one hour data would influence the determination that the facility was or was not in compliance

with the SIP emission limit. USEPA in its April 23, 2014 Guidance for One Hour SO2 Nonattainment Area SIP Submittals[2] describes a method for converting one hour modeled emission rates into longer term average emission limits.

It is the desire of Kentucky Power and Wheeling Power that the emission limit for the Mitchell Plant be set on a longer averaging time basis than one hour. While not done as part of this modeling study, an evaluation of historic Mitchell Plant CEMS data has been performed and is being submitted separately from this report. The result of this evaluation additional should be used in conjunction with this modeling study to determine the appropriate long term emission limit for use at Mitchell Plant.

REFERENCES

1. Ohio EPA, *State of Ohio Nonattainment Area State Implementation Plan and Demonstration of Attainment for 1-Hour SO2 Nonattainment Areas,* April 3, 2015, Updated October 13, 2015, Appendix E, Found at http://epa.ohio.gov/dapc/SIP/so2.aspx, last checked September 27, 2016.
2. USEPA, *Guidance for One Hour SO2 Nonattainment Area SIP Submittals*, April 23, 2014, Appendix C.